60457180

CONTROL DATA CORPORATION

CYBER INITIALIZATION PACKAGE (CIP) REFERENCE MANUAL

CDC® COMPUTER SYSTEMS:
CYBER 180
CYBER 170
CYBER 170M
CYBER 70
MODELS 71, 72, 73, 74
6000

CYBER Initialization Package (CIP)

Reference Manual

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Revision J of this manual incorporates changes at CIP level 700. Changes include addition of documentation for the CC596A console, installation of NOS/VE boot programs, and miscellaneous engineering changes.

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About This Manual

The CIP User's Handbook includes information on how to install and use the CONTROL DATA® CYBER Initialization Package (CIP) on CDC® CYBER 810A, 830A, 840A, 850A, 860A, 870A, 990E and 995E; CYBER 180 computer systems models 810, 830, 835, 840, 845, 850, 855, 860, and 990; CDC CYBER 170 computer systems models 171, 172, 173, 174, 175, 176, 720, 730, 740, 750, 760, 815, 825, 835, 845, 855, 865, and 875; CDC CYBER 170M computer system model 875; CDC CYBER 70 computer systems models 71, 72, 73, and 74; and 6000 computer systems.

Organization

This handbook is organized into seven sections and nine appendixes. Section 1 introduces CIP, noting its advantages and implications. Since many CIP features are model dependent, sections 2 through 4 provide model-dependent procedures and displays. These sections include procedures for installing CIP and for performing an operating system deadstart, and describe the various deadstart displays and the options offered.

Sections 5 and 6 provide procedural summaries and overviews that are applicable to several models of computers. Section 5 provides deadstart procedure summaries, coldstart procedures, and deadstart programs. Section 6 provides general procedures that are applicable to most or all of the computer systems.

Section 7 provides reference information for the monitor display driver (MDD).

The appendixes include a glossary of terms, a directory of error messages, a directory of HIVS tests, and CIP installation and maintenance information oriented toward the customer engineer (CE).

Audience

This manual is directed to CEs, operators, and site analysts responsible for installing and maintaining CIP on any of the previously mentioned Control Data computer system.

Conventions

This handbook includes many procedures you work through at the system operator console. In describing the entries you make at your console keyboard, one of the phrases used is "press the carriage return key" to describe how to terminate an entry. The specific key you press to terminate an entry varies depending on the type of operator console you are using, CC545, CC634B, or CC596A.

The method of initiating a deadstart also varies depending on the type of operator console. To deadstart using the CC545, you simply press the DEADSTART button on the console. When using the CC634B, you must perform a CTRL-G, CTRL-R sequence to start the deadstart process. This sequence is described for specific computer system models elsewhere in this handbook. When using the CC596A, you must perform a CNTRL F2 sequence to start the deadstart process.

New features, as well as technical changes, deletions, and additions in this manual, are indicated by vertical bars in the margin.

Model Classification by IOU Configuration and Upgrade

The categories used in section 2 of this manual are based on IOU Models, that is, "Iln Class Systems" refers to the Models 10, 11, 12, 13, and 14 single IOU configurations used in CYBER 180 Models 810/830/,815/825 and CYBER 810A/830A computer systems. Sections 3 and 4 continue to use CDC computer system model designations.

I1n Class Systems	CYBER 180 Models 810/830, 815/825 CYBER 810A/830A
I2n Class Systems	CYBER 180 Models 835, 845/855, 840/850/860
I4n Class Systems	CYBER 840A/850A/860A/870A
I4n Upgrade Class Systems	CYBER 180 Models 845/855, 840/850/860
I4n 990 Class Systems	CYBER 180 Model 990 CYBER 990E/995E

Related Publications

Procedures and descriptions within this manual may refer you to information in the following related Control Data publications.

Control Data Publication	Publication Number
NOS Version 2 Administration Handbook	60459840
NOS Version 2 Analysis Handbook	60459300
NOS Version 2 Installation Handbook	60459320
NOS Version 2 Operations Handbook	60459310
NOS/BE Installation Handbook	60494300
NOS/BE Operator's Guide	60493900
NOS/BE System Programmer's Reference Manual, Volume 1	60494100
CYBER 170 Computer Systems Models 815 and 825 Hardware Operator's Guide	60469370
CYBER 170 System Models 835, 845, and 855 Hardware Operator's Guide	60458390
CYBER 180 Computer Systems Models 810 and 830 Hardware Operator's Guide	60469440
MSL 140 Off-Line Maintenance Software Library Reference Manual	60459860
MSL 15X Off-Line Maintenance Software Library Reference Manual	60456530

Control Data Publication	Publication Number
721-21/31 Owner's Manual	62950101
NOS/VE Operations Manual	60463914
NOS/VE Installation and Upgrade Manual	60463913
CDC 19003 System Console Hardware/Maintenance Guide	60463610

Disclaimer

This product is intended for use only as described in this document. Control Data cannot be responsible for the proper functioning of undescribed features or parameters.

Introduction 1

The CYBER Initialization Package (CIP) provides a simple process for distributing and installing the following hardware/software interface modules.

- Common Test and Initialization (CTI)
- Environment Interface (EI)
- Express Deadstart Dump (EDD)
- Hardware Initialization and Verification Software (HIVS)/Maintenance Software Library (MSL)
- Microcode
- Monitor Display Driver (MDD)
- System Console Driver (SCD)
- Dedicated Fault Tolerance (DFT)
- NOS/VE Boot Environment Programs
- System Console Interface (SCI)

CIP module combinations for individual computer systems follow.

- For CYBER 170/180 computer systems models 810, 810A, 815, 825, 830, 830A, 840, 845, 850, 855, 860 and 990, and CYBER 180 computer systems models 840A, 850A, 860A 990E, 995E, CIP contains CTI, EI, MDD, microcode, MSL, DFT, NOS/VE boot environment programs, SCD, and SCI.

  NOTE

  In section 2, these CYBER computer systems are categorized by IOU configuration and upgrade status. See Model Classification by IOU Configuration and Upgrade in About This Manual.

- For CYBER 170 models 865 and 875, CIP contains CTI and MSL.
- For CYBER 170 models 170 and 700; CYBER 70 models 71, 72, 73, and 74; and 6000 computer systems, CIP contains CTI and HIVS.

CIP Features

Two CIP features simplify the installation and use of the CIP modules. They are the automatic installation option and the help displays.

Automatic Installation Option

You can automatically install CIP by selecting a single installation option, which installs all of the CIP modules. CIP is installed to coexist with operating system information on the deadstart disk.

Installation can be performed either in initialize or update mode. Initialize mode initializes the deadstart disk and installs CIP, preserving no other information. Update mode installs CIP to the deadstart disk and preserves operating system information on the disk, including permanent files.

NOTE

The options to install CIP modules individually are provided for emergency CIP repair only.

Help Displays

The CTI module includes help displays that assist you in executing most of the deadstart utilities without consulting a manual.

Considerations for Sites with CYBER 170/180 Model 800, 800 Upgraded, and 990/995 Computer Systems

CIP benefits sites with CYBER 170/180 model 800, 800 upgraded, and 990/995 Class computer systems more significantly than sites that do not have the model 800 A and E Class computer systems. The following paragraphs explain how the process affects these computer system sites, including sites with models 865 and 875.

CIP Release and Distribution

CIP is released when a change (either a new feature or a correction) is made to one of the CIP modules. A CIP release is planned to occur when a software release to each CDC operating system (NOS, NOS/BE, NOS/VE) is scheduled to occur. A critical problem that must be fixed between planned releases will cause a CIP Batch Corrective Update (BCU) release.

CIP is released on SCOPE Internal (SI) format magnetic tape [recorded in phase-encoded (PE) mode] and is distributed with the operating system to model 800 computer system sites.

The customer informs you that CIP has been received and you recommend installation of the CIP, based on the Field Change Announcement (FCA) data distributed with the release. If the CIP is to be installed, the installation should be a joint effort between the customer and the CE. The actual installation requires approximately 20 minutes of dedicated machine time.

Disk Space Requirements

CIP must be installed to disk. When CIP is installed, disk space is reserved automatically for MSL, which provides the off-line diagnostics. Disk residence of MSL in the production environment facilitates hardware preventive maintenance and reduces problem reaction time. Table 1-1 shows disk space requirements for CYBER mainframes.

Table 1-1. Disk Space Requirements for CYBER Mainframes

Disk	Models 810-830		Models 835-990, A, E[1]
	Full	Short	
844-21	28.0%	17.3%	28.0%
844-4X	14.0%	8.6%	14.0%
885	4.8%	3.1%	4.8%
895	N/A	N/A	8.2%
834	20.0%	12.1%	N/A
836	6.7%	4.1%	N/A

1. Not applicable to models 865 and 875.

Tailored CIP

The CIP tape is tailored for each model 800 computer system. For example, an 835 CIP contains microcode and an MSL unique to the CYBER 170 or CYBER 180 model 835.

CIP Device Access by the Host

When running NOS/VE in dual state, the CIP device must be accessible by the host operating system (NOS or NOS/BE). It cannot be on an exclusive NOS/VE channel because the CIP device is accessed through the host system in dual state.

NOTE

Sites may use a NOS or NOS/BE deadstart tape containing CTI as the operating system load file. However, the CTI on the deadstart tape cannot be used to initialize the mainframe; no operating system tape deadstart capability is provided.

Sites with No Maintenance Contract

CYBER computer systems installed at sites with no maintenance contract will receive a CIP tape containing HIVS instead of MSL (HIVS is a subset of MSL) upon receipt of the computer system. To order a new CIP after that, the marketing representative must send LDS Data Form #AA5570 to Software Manufacturing and Distribution, ARH 230, 4201 N. Lexington, Arden Hills, MN, specifying the mainframe type.

Considerations for Sites with Non-Model 800 Computer Systems

The CIP tape replaces the HIVS tape. CIP content and function are the same as HIVS in that the CIP tape:

- Contains CTI and HIVS modules.
- Is distributed with an operating system order (not as an FCO).
- Provides hardware verification sequencer and deadstart utilities.
- Provides disk deadstart capability if installed to disk.

NOTE

Disk residence of CIP is not a requirement.

To order CIP, the CDC marketing representative must send LDS Data Form #AA5570 to Software Manufacturing and Development, ARH 230, 4201 N. Lexington, Arden Hills, MN, specifying the mainframe type.

CIP Procedures, Displays, and Options for I1n, I2n, and I4n Class Systems 2

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CIP Procedures, Displays, and Options for I1n, I2n, and I4n Class Systems 2

This section includes CIP automatic installation procedures, operating system procedures, and descriptions of CIP displays and options available to users of the following CDC® computer systems. The categories used in this section are based on IOU models, that is, "Iln Class Systems" refers to the Models 10, 11, 12, 13, and 14 single IOU configurations used in CYBER 180 Models 810/830, 815/825, and CYBER 810A/830A computer systems.

Iln Class Systems	CYBER 180 Models 810/830, 815/825 CYBER 810A/830A
I2n Class Systems	CYBER 180 Models 835, 845/855, 840/850/860
I4n Class Systems	CYBER 840A/850A/860A/870A
I4n Upgrade Class Systems	CYBER 180 Models 845/855, 840/850/860
I4n 990 Class Systems	CYBER 180 Model 990 CYBER 990E/995E

CAUTION

For CYBER 170/180 systems using a NOS/VE version previous to 1.2.1, CIP should not be installed on a NOS/VE device. NOS/VE does not recognize CIP as a read-only disk area and will write over it.

NOTE

If the tape does not move or it fails to rewind after moving forward, refer to the 689 CYBER Magnetic Tape Subsystem (CMTS) Users Guide, publication number 60000009, section 5, Troubleshooting.

CIP Installation, Iln and All Single IOU I4n Class Systems

The CIP modules must be installed to disk for the Iln and all I4n Class systems. Select a disk unit in your configuration to be the deadstart disk. The installation process installs the CIP modules to the deadstart disk so that operating system information can also reside on the disk.

NOTE

The deadstart device must *not* be shared by any other mainframe.

Complete the following procedure to initially install CIP to the deadstart disk or to update CIP on the deadstart disk. The installation procedure requires dedicated machine time. At least one tape drive and one disk unit must be available. The procedure assumes that controlware has been loaded into the peripheral controller(s). If the controlware is not loaded, refer to section 5 of this handbook for coldstart instructions.

1. Mount the CIP tape on a tape drive.
2. Press the DEADSTART button on a CC545 to initiate deadstart from the tape. The DEADSTART OPTIONS display appears. For models 815/825, go to step 3.

   If a CC634B is being used as the primary console, complete the following steps to bring up the DEADSTART OPTIONS display.

   a. Press the RESET button to reinitialize the console.

   b. Hold down the CTRL key while pressing the G key.

   c. When the message `*OPERATOR ACCESS ENABLED*` appears on the screen, hold down the CTRL key while pressing the R key.

   If a CC596A is being used as the primary console, complete the follow steps to bring up the DEADSTART OPTIONS display.

   a. Press the CTRL, ALT, and DEL keys simultaneously to reinitialize the console. The DEADSTART OPTIONS display appears.

   b. HOLD down the CTRL key while pressing the F2 key and release.
3. Enter an S to select the SYSTEM LOAD option if the deadstart program selected is for deadstart from CIP tape.

   Otherwise, perform the following steps if the deadstart program selected is not for deadstart from CIP tape.

   a. Enter an M to select the MAINTENANCE OPTIONS display.

   b. Enter or retrieve the deadstart from CIP tape program as described under Warmstart Procedure for I1n and All I4n Class Systems in section 5.

   c. Enter an S to select the short deadstart sequence.
4. Press the carriage return key to select the default option. The BUILD DEADSTART DISK display appears.

NOTE

For the CYBER mainframe sites with no maintenance contract, enter an I, INITIAL INSTALLATION option to initialize the disk and install CTI and HIVS. Although the CIP tape for such sites contains no off-line maintenance diagnostics, it must be installed to the deadstart disk.

CAUTION

Do not proceed until you have read all the instructions for step 5.

5. For first time installation of CIP, perform one of the following steps.

   a. For first time installation of the CIP for single I4n, I4n Upgrade, and I4n 990 Class systems, enter I, INITIAL INSTALLATION option.

   b. For first time installation of CIP for I1n Class systems, enter either S to select the SHORT INSTALLATION option, or enter F to select the FULL INSTALLATION option, based on the following information.

      NOTE

      The INITIAL INSTALLATION, SHORT INSTALLATION, and FULL INSTALLATION options destroy all information on the deadstart disk, except for the disk microcode, prior to installing CIP. Before executing either the short or full option, be sure you have a backup copy of any information on the deadstart disk that you want to preserve, including operating system permanent files and CE command buffers.

      After executing the initial, short, or full option, you must perform an operating system initialization of the disk.

      S The SHORT INSTALLATION option initializes the deadstart disk and installs most of CIP. The CIP tape contains off-line maintenance diagnostics that you use to execute mainframe tests for preventive maintenance or to diagnose a hardware error. The SHORT INSTALLATION option installs a predefined set of diagnostics (diagnostics you use frequently). Those used infrequently can be loaded and executed from the CIP tape when needed. The SHORT INSTALLATION option reserves 15 megabytes of disk storage for the CIP.

      F The FULL INSTALLATION option initializes the deadstart disk and installs all of CIP. The FULL INSTALLATION option reserves 25 megabytes of disk storage for CIP.

6. For reinstallation of CIP for all CYBER systems some time after the initial installation, enter U to select the UPDATE option.

   U The UPDATE option replaces CIP on the deadstart disk and preserves operating system information on the deadstart disk, including permanent files. The UPDATE option replaces CIP in the same mode, short or full, that was used when the deadstart disk was initialized.

The CIP modules replaced during an update are:

CTI (Common Test and Initialization)
EDD (Express Deadstart Dump)
EI (Environmental Interface)
MSL (Maintenance Software Library) (includes command buffers)
Microcode (Peripheral and Mainframe)
MDD (Monitor Display Driver)
SCD (System Console Driver)
DFT (Dedicated Fault Tolerance)
SCI (System Console Interface)[1]
NOS/VE Programs[1]

Information saved during an update includes:

DEL (Deadstart Error Log)
DPB (Default Parameter Block)
Operating system pointers and permanent files
NOS/VE system file pointers
MRT (Mainframe Reconfiguration Table)
CFT (Central Memory Flaw Table)

7. Enter the channel, equipment, and unit numbers of the deadstart disk when prompted. Follow each entry by pressing the carriage return key. Press only the carriage return key to select the displayed default value.

8. CIP installation is complete when the message `INSTALLATION COMPLETE` appears.

NOTE

Effective with CIP V9 Level 700, installation of CIP components for NOS/VE system is a two step process. Step one installs all hardware related components. Step two installs the current NOS/VE release boot programs.

1. These are replaced only if the NOS/VE boot programs are not installed in the system.

NOS/VE Boot Program Installation

1. Mount the tape containing the NOS/VE boot programs. For NOS/VE 1.3.1 L700 this is the CIP V9 L700 CIP TAPE.

2. Deadstart to the CIP device on which the NOS/VE boot programs are to be installed.

3. From the INITIAL OPTIONS display, enter a U for the UTILITIES display.

4. From the UTILITIES display, select the V option, INSTALL NOS/VE BOOT PROGRAMS.

5. CTI prompts for the tape equipment, channel and unit number of the tape drive used for reading NOS/VE boot programs. CTI dynamically determines if it is reading the correct tape containing the NOS/VE boot programs. If CTI cannot identify the tape, it will display the following message:

   ```
   TAPE ON UNIT nn NOT RECOGNIZED

   ENTER (CR) TO CONTINUE
   ```

   Press the carriage return key (CR) and CTI allows you to mount the correct tape and/or specify the correct path.

   CTI automatically installs the NOS/VE boot programs to the appropriate section of the Common Disk Area (CDA). After a successful install, the UTILITIES display will reappear.

   You can now perform an operating system load, off-line maintenance, default deadstart device definition, or other deadstart utility operation. Refer to section 9.

CIP Installation, Dual IOU I4n Class Systems

1. Mount the CIP tape on a tape drive.
2. In a DUAL IOU environment use the CC596A as the primary console, and complete the following steps to bring up the DEADSTART OPTIONS display.
   a. Press the CTRL, ALT, and DEL keys simultaneously to reinitialize the console. The DEADSTART OPTIONS display will appear.
   b. HOLD down the CTRL key while pressing the F2 key and release.
3. Enter S to select the SYSTEM LOAD option if the deadstart program selected is for deadstart from CIP tape.

   Otherwise, perform the following steps if the deadstart program is not for deadstart from CIP tape.
   a. Enter M to select the MAINTENANCE OPTIONS display.
   b. Press 0 for IOU0 and enter or retrieve the deadstart from CIP tape program as described under Warmstart Procedure for All I4n Class Systems in section 5.
   c. Enter S to select the short deadstart sequence.
4. Press the carriage return key (CR) to select the default option. The BUILD DEADSTART DISK display appears.

   CAUTION

   Do not proceed until you have read all the instructions for step 5.

5. For first time installation of CIP, enter I, INITIAL INSTALLATION option.

   NOTE

   The INITIAL INSTALLATION option destroys all information on the deadstart disk, except for the disk microcode, prior to installing CIP. Before executing this options be sure you have a backup copy of any information on the deadstart disk that you wish to preserve, including operating system permanent files and CE command buffers.

6. For reinstallation of CIP, enter U to select the UPDATE option.

   The UPDATE option replaces CIP on the deadstart disk and preserves operating system information on the deadstart disk, including permanaent files. The UPDATE option replaces CIP in the same mode that was used when the deadstart disk was initialized.

   The CIP modules replaced during an update are:

   CTI (Common Test and Initialization)
   EDD (Express Deadstart Dump)
   EI (Environmental Interface)
   MSL (Maintenance Software Library) (includes command buffers)
   Microcode (Peripheral and Mainframe)
   MDD (Monitor Display Driver)
   SCD (System Console Driver)
   DFT (Dedicated Fault Tolerance)
   SCI (System Console Interface)[2]
   NOS/VE Programs[2]

   Information saved during an update includes:

   DEL (Deadstart Error Log)
   DPB (Default Parameter Block)
   Operating system pointers and system files
   NOS/VE system file pointers
   MRT (Mainframe Reconfiguration Table)
   CFT (Central Memory Flaw Table)

7. Enter the channel, equipment, and unit number of the deadstart disk when prompted. Follow each entry with a carriage return (CR). Press only the carriage return key (CR) to select the displayed default value.

8. CIP installation is complete when the message `INSTALLATION COMPLETE` appears.

NOTE

Effective as of CIP V9 L700, installation of CIP components for NOS/VE systems ia two part process. Step one installs all hardware related components. Step two installs the current NOS/VE release boot programs.

2. These are replaced only if the NOS/VE boot programs are not installed in the system.

NOS/VE Boot Program Installation

1. Mount the tape containing the NOS/VE boot programs. For NOS/VE 1.3.1 L700 this is the CIP V9 L700 CIP TAPE.
2. Deadstart to the CIP device on which the NOS/VE boot programs are to be installed.
3. From the INITIAL OPTIONS display, enter a U for the UTILITIES display.
4. From the UTILITIES display, select the V option, INSTALL NOS/VE BOOT PROGRAMS.
5. CTI prompts for the tape equipment, channel and unit number of the tape drive used for reading NOS/VE boot programs. CTI dynamically determines if it is reading the correct tape containing the NOS/VE boot programs. If CTI cannot identify the tape, it will display the following message:

   ```
   TAPE ON UNIT nn NOT RECOGNIZED

   ENTER (CR) TO CONTINUE
   ```

   Press the carriage return key (CR) and CTI allows you to mount the correct tape and/or specify the correct path.

   CTI automatically installs the NOS/VE boot programs to the appropriate section of the Common Disk Area (CDA). After a successful install, the UTILITIES display will reappear.

You can now perform an operating system load, off-line maintenance, default deadstart device definition, or other deadstart utility operations. Refer to Section 9.

CIP Installation, I2n Class Systems

The CIP modules must be installed to disk for I2n Class systems. Select a disk unit in your configuration to be the deadstart disk. The installation process installs the CIP modules to the deadstart disk so that operating system information may also reside on the disk.

Install CIP to the deadstart disk or update CIP on the deadstart disk using the following procedure. The installation procedure requires dedicated machine time. At least one tape drive and one disk unit must be available. The procedure assumes that controlware has been loaded into the peripheral controller(s). If the controlware is not loaded, refer to section 5 for coldstart instructions.

1. Mount the CIP tape on a tape drive.
2. Set the deadstart program for a deadstart from the CIP tape. Refer to section 5.
3. Press the DEADSTART button (NOS or NOS/BE with a CC545 terminal). The BUILD DEADSTART DISK display appears.

   NOTE

   Deadstart from a CC634B terminal (required for NOS/VE standalone) is not normally supported for I2n Class systems.

   Under certain conditions, users with both CC545 and CC634B consoles can initiate a deadstart by pressing the DEADSTART button on the CC545 or using the switch on the deadstart panel and have the displays appear on the CC634B console. For NOS/VE standalone, a CC634B terminal with option GK427A installed is required. This installs a DEADSTART button on the CC634B terminal. For details, refer to Deadstart Procedure Summaries and Setting Word 12 in section 5.

4. Press the carriage return key to select the default option, BUILD DEADSTART DISK. The BUILD DEADSTART DISK display appears.

   CAUTION

   Do not proceed until you have read all the instructions for step 5.

5. For first time installation of CIP tape select I, INITIAL INSTALLATION option, which initializes the deadstart disk and installs CIP. The INITIAL INSTALLATION option reserves 25 megabytes of disk storage for CIP.

   NOTE

   The INITIAL INSTALLATION option destroys all information on the deadstart disk, except the disk microcode, prior to installing CIP. Before executing the INITIAL INSTALLATION option, be sure you have a backup copy of any information on the deadstart disk that you want to preserve, including operating system permanent files and CE command buffers.

   After executing the INITIAL INSTALLATION option, you must perform an operating system initialization of the disk.

For installation of CIP some time after the initial installation, enter U to select the UPDATE option. The UPDATE option replaces CIP on the deadstart disk and preserves operating system information on the deadstart disk, including permanent files.

The CIP modules replaced during an Update are:

CTI (Common Test and Initialization)
EDD (Express Deadstart Dump)
EI (Environmental Interface)
MSL (Maintenance Software Library) (includes command buffers)
Microcode (Perpheral and Mainframe)
MDD (Monitor Display Driver)
SCD System Console Driver)
DFT (Dedicated Fault Tolerance)
SCI (System Console Interface)[3]
NOS/VE Programs[3]

Information saved during an update includes:

DEL (Deadstart Error Log)
DPB (Default Parameter Block)
Operating system pointers and permanent files
NOS/VE system file pointers
MRT (Mainframe Reconfiguration Table)
CFT (Central Memory Flaw Table)

6. Enter the channel, equipment, and unit numbers of the deadstart disk when prompted. Follow each by pressing the carriage return key. Press only the carriage return key to select the displayed default value.

7. CIP installation is complete when the message `INSTALLATION COMPLETE` appears.

NOTE

Effective with CIP V9 Level 700, installation of CIP components for NOS/VE system is a two step process. Step one installs all hardware related components. Step two installs the current NOS/VE release boot programs.

3. These are replaced only if the NOS/VE boot programs are not installed in the system.

NOS/VE Boot Program Installation

1. Mount the tape containing the NOS/VE boot programs. For NOS/VE 1.3.1 L700 this is the CIP V9 L700 CIP TAPE.
2. Deadstart to the CIP device on which the NOS/VE boot programs are to be installed.
3. From the INITIAL OPTIONS display, enter a U for the UTILITIES display.
4. From the UTILITIES display, select the V option, INSTALL NOS/VE BOOT PROGRAMS.
5. CTI prompts for the tape equipment, channel and unit number of the tape drive used for reading NOS/VE boot programs. CTI dynamically determines if it is reading the correct tape containing the NOS/VE boot programs. If CTI cannot identify the tape, it will display the following message:

   ```
   TAPE ON UNIT nn NOT RECOGNIZED

   ENTER (CR) TO CONTINUE
   ```

   Press the carriage return key (CR) and CTI allows you to mount the correct tape and/or specify the correct path.

   CTI automatically installs the NOS/VE boot programs to the appropriate section of the Common Disk Area (CDA). After a successful install, the UTILITIES display will reappear.

   You can now perform an operating system load, off-line maintenance, DPB definition, or other deadstart utility operation. Refer to section 6.

OS Deadstart, Iln, I2n, and All I4n Class Systems

An operating system deadstart can be performed on Iln, I2n, and all I4n Class systems only when CIP has been installed on disk. Operating system load from a tape file is supported for Iln, I2n, and all I4n Class computer systems through the disk deadstart process.

The operating system deadstart procedures require at least one disk unit and, when the operating system file is on tape, one tape unit. The procedures assume that controlware has been loaded into the peripheral controller(s). If the controlware is not loaded, refer to section 5 for coldstart instructions.

Disk Deadstart

This procedure assumes that:

- The deadstart program shown as selected on the DEADSTART OPTION display is set for deadstart from disk.
- CIP has been installed to disk. Refer to CIP Installation earlier in this section.

If the operating system file has also been installed to disk, a complete disk deadstart can be performed. Refer to the NOS 2 Analysis Handbook, INSTALL command, to find out how to install the NOS file to disk. The NOS/BE level 0 deadstart process automatically installs the NOS/BE file on disk for use on following deadstarts. For NOS/VE standalone, refer to the NOS/VE Software Release Bulletin (SRB) for procedures to install NOS/VE to disk.

Operating System File on Disk for Iln, I4n, I4n Upgrade, and I4n 990 Class Systems

1. Press the DEADSTART button on a CC545 display. The DEADSTART OPTIONS display appears.

   If a CC634B is being used as the primary console, complete the following steps to bring up the DEADSTART OPTIONS display:

   a. Press the RESET button to reinitialize the console.

   b. Hold down the CTRL key while pressing the G key.

   c. When the message *OPERATOR ACCESS ENABLED* appears on the screen, hold down the CTRL key while pressing the R key. The DEADSTART OPTIONS display appears.

   If a CC596A is being used as the primary console, complete the follow steps to bring up the DEADSTART OPTIONS display.

   a. Press the CTRL, ALT, and DEL keys simultaneously to reinitialize the console. The DEADSTART OPTIONS display appears.

   b. HOLD down the CTRL key while pressing the F2 key and release.

2. Enter S, then press the carriage return key. The INITIAL OPTIONS display appears.

3. Press the carriage return key to select the default option, AUTOMATIC OS LOAD. This option assumes that the deadstart program is set correctly for deadstart level (0, 1, 2, 3) and for CMRDECK selection (NOS), or for CMR selection (NOS/BE), or for DCFILE selection (NOS/VE).

   If the deadstart program is set correctly, operating system deadstart is initiated.

4. If the deadstart program is not set correctly for these selections, enter O to select the OPERATOR INTERVENTION option. Operator intervention also allows reconfiguration of mainframe hardware components and execution of the hardware verification sequences. For specific information regarding operator intervention options, refer to displays and options for deadstart from disk later in this section.

Operating System File on Tape or Alternate Disk for I1n, I4n, I4n Upgrade, and I4n 990 Class Systems

1. Press the DEADSTART button on a CC545 console. The DEADSTART OPTIONS display appears.

   If a CC634B is being used as the primary console, complete the following steps to bring up the DEADSTART OPTIONS display.

   a. Press the RESET button to reinitialize the console.

   b. Hold down the CTRL key while pressing the G key.

   c. When the message *OPERATOR ACCESS ENABLED* appears on the screen, hold down the CTRL key while pressing the R key.

   If a CC596A is being used as the primary console, complete the follow steps to bring up the DEADSTART OPTIONS display.

   a. Press the CTRL, ALT, and DEL keys simultaneously to reinitialize the console. The DEADSTART OPTIONS display appears.

   b. HOLD down the CTRL key while pressing the F2 key and release.

2. Enter S or press the carriage return key. The INITIAL OPTIONS display appears.

3. Enter O to select the operator intervention option. The OPERATOR INTERVENTION display appears.

4. If the deadstart program is not set correctly for deadstart level and for CMRDECK selection (NOS), CMR selection (NOS/BE), or DCFILE selection (NOS/VE), before proceeding, enter P to select the deadstart parameters option. Operator intervention also allows reconfiguration of the mainframe hardware components and execution of hardware verification sequences. For specific information regarding operator intervention options, refer to the displays and options for deadstart from disk, later in this section.

5. Enter S to select tape or alternate disk deadstart.

   a. Tape Deadstart

      1) Enter T to deadstart using a tape.

      2) Enter tape type, channel, equipment, and unit when prompted.[4]

   b. Alternate Disk Deadstart

      1) Enter D to select alternate disk deadstart.

      2) Enter disk channel, equipment, and unit when prompted.[4]

6. Enter tape type, channel, equipment, and unit when prompted.

7. Press the carriage return key. Operating system deadstart is initiated.[4]

8. You will see messages showing that NOS or NOS/BE is loading programs and running tests.

Operating System File on Tape or Alternate Disk I2n Class Systems

1. Press the DEADSTART button to initiate deadstart. The INITIAL OPTIONS display appears.

   NOTE

   Deadstart from a CC634B console (required for NOS/VE standalone) is not normally supported for I2n Class systems.

   Under certain conditions, users with both CC545 and CC634B consoles can initiate a deadstart by pressing the DEADSTART button on the CC545 or using the switch on the deadstart panel and have the displays appear on the CC634B console. For NOS/VE standalone, a CC634B console with option GK427A installed is required. This installs a DEADSTART button on the CC634B console. For details, refer to Deadstart Procedure Summaries and Setting Word 12 in section 5.

2. Enter O to select the OS LOAD WITH INTERVENTION option. The OPERATOR INTERVENTION display appears.

3. If the deadstart program is not set correctly for deadstart level and for CMRDECK selection (NOS) or CMR selection (NOS/BE), or DCFILE selection (NOS/VE), before proceeding, enter P to select the DEADSTART PANEL PARAMETERS option. Operator intervention also allows reconfiguration of the mainframe hardware components and execution of hardware verification sequences. For specific information regarding operator intervention, refer to the displays and options for deadstart from disk later in this section.

4. Applicable for NOS and NOS/BE deadstarts only. For NOS/VE deadstarts, the operating system deadstart sequence is initiated upon selecting the D or T option. (Reference the NOS/VE Operations Manual for more information on NOS/VE Deadstarts.)

4. Enter S to select tape or alternate disk deadstart.

   a. Tape Deadstart

      1) Enter T to deadstart using a tape.

      2) Enter tape type, channel, equipment, and unit when prompted.[5]

   b. Alternate Disk Deadstart

      1) Enter D to select alternate disk deadstart.

      2) Enter disk channel, equipment, and unit when prompted.[5]

5. Press the carriage return key. Operating system deadstart is initiated.[5]

6. You will see messages indicating that NOS or NOS/BE is loading programs and running tests.

5. Applicable for NOS and NOS/BE deadstarts only. For NOS/VE deadstarts, the operating System deadstart sequence is initiated upon selecting the D or T option. (Reference the NOS/VE Operations Manual for more information on NOS/VE Deadstarts.)

Disk Deadstart Displays, I1n, I2n, and All I4n Class Systems

The CIP disk deadstart displays and options included in this section incorporate the following conventions.

- The first option listed on a menu display is the default option. The option can be selected automatically by pressing the carriage return key.
- Help information is provided for the INITIAL OPTIONS display. The HELP display supplies brief information about the options. More detailed option information is given elsewhere in this section.
- Pressing the backspace key allows you to return to the previous display.

Overview

Figures 2-1, 2-2, and 2-3 provide overviews of the displays and options available during a deadstart from disk on I1n, I2n, and all I4n Class systems.

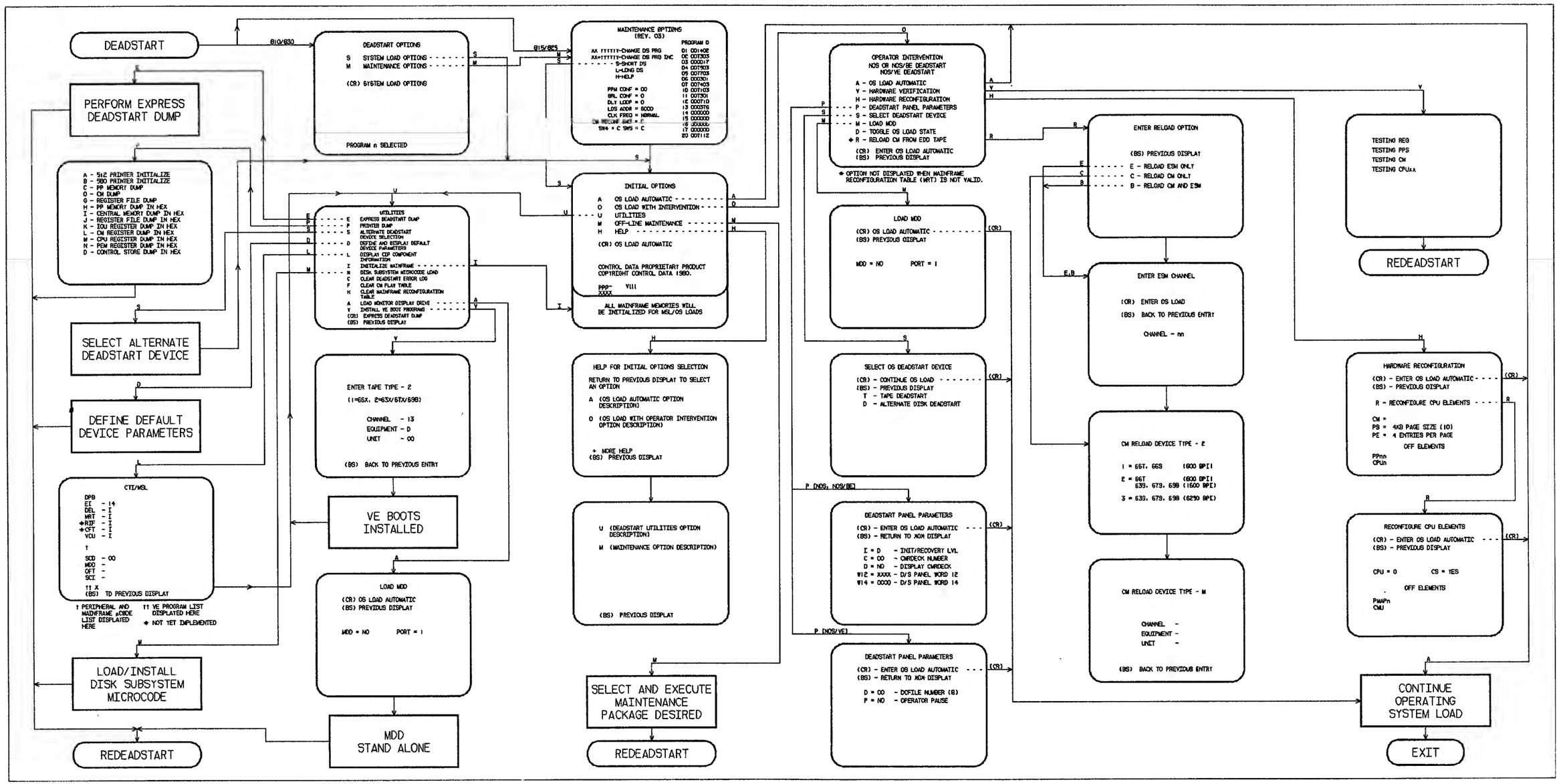


Figure 2-1. Overview of Displays for I1n Class Systems, Deadstart From Disk

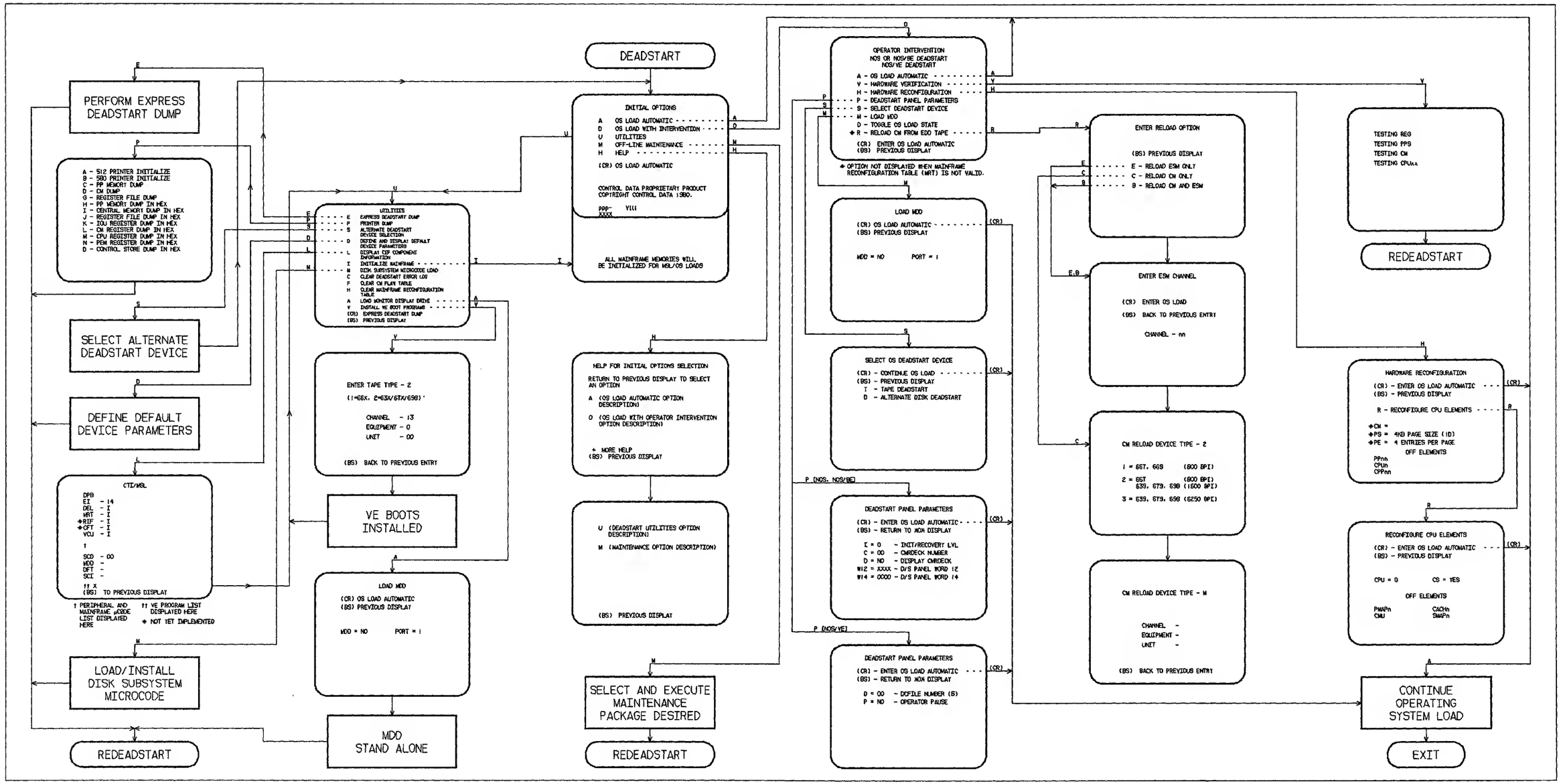


Figure 2-2. Overview of Displays for I2n Class Systems, Deadstart From Disk

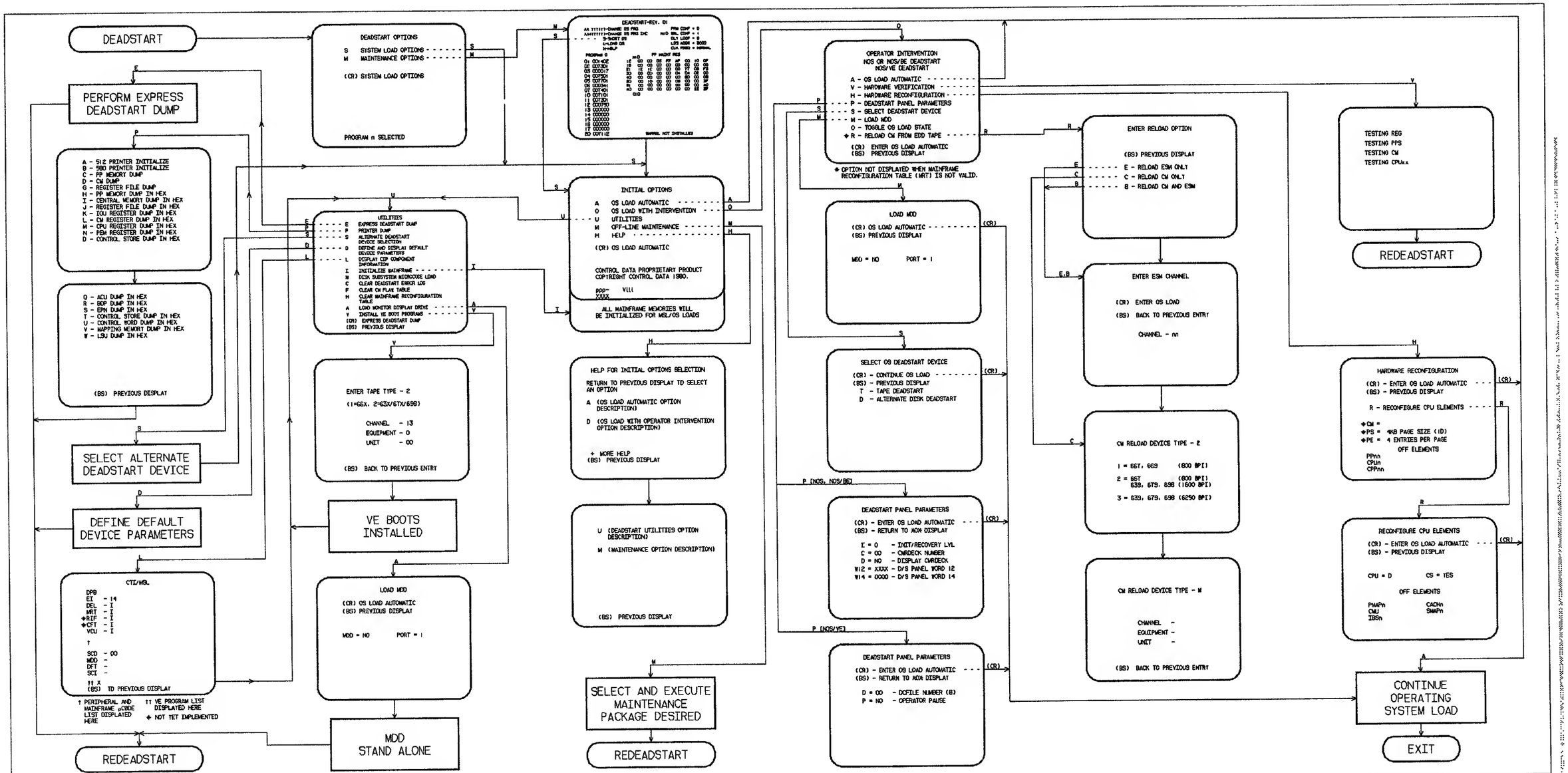


Figure 2-3. Overview of Displays for I4n Class Systems, Deadstart From Disk

Initial Options Display

The INITIAL OPTIONS display, figure 2-4, is the first screen that appears after deadstart is initiated.

The INITIAL OPTIONS display provides operating system load, execution of off-line maintenance, and deadstart utilities when the deadstart program is set for deadstart from disk.

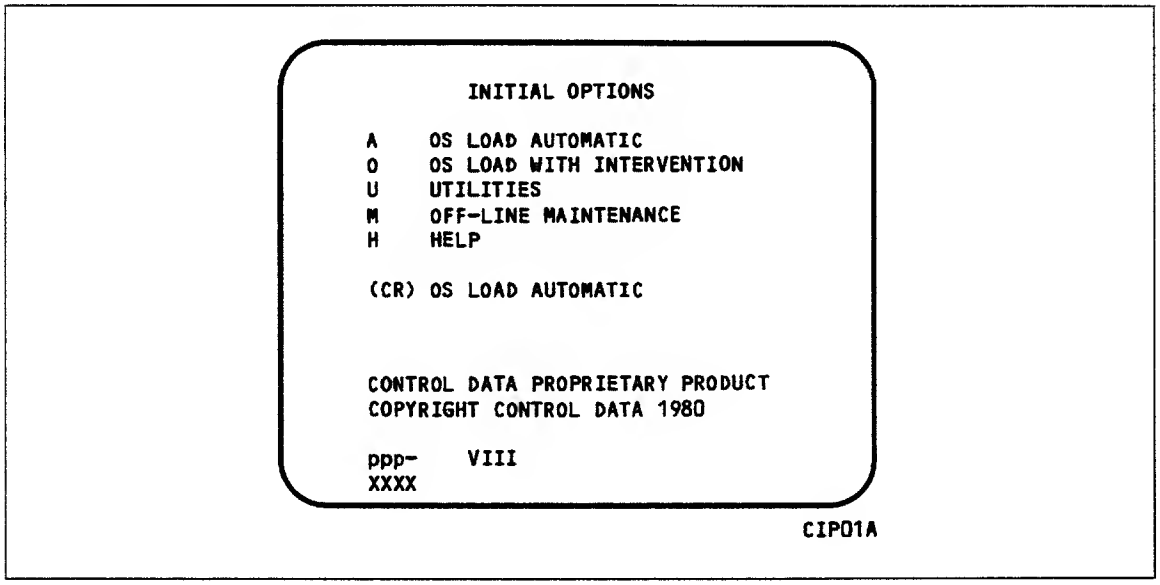


Figure 2-4. Initial Options From Disk for I1n, I2n, and All I4n Class Systems

Option	Description

(CR) or A	OS LOAD AUTOMATIC. The system initialization software assumes that CIP has been installed to the deadstart disk. The system loads modules from the deadstart disk into memory and the central processor to establish the operating environment. Then, confidence tests verify the ability of PP memory to hold simple data patterns and preset PP memory contents to all ones.
	
	If the system detects a fatal error during confidence testing, CTI records the errors in the DEL, if it is empty, for later processing by the operating system, then automatically attempts to retry the initialization. The following information appears on the left screen, if the DEL is full.
	
	`ERRORS WERE CLEARED BUT NOT LOGGED`
	`DEADSTART ABORTED - FATAL ERROR`
	
	`eeee-nn rrrr =cc cc cc cc cc cc cc cc`
	`rrrr =cc cc cc cc cc cc cc cc`
	`rrrr =cc cc cc cc cc cc cc cc`

Option **Description**

Notation	Description
eeee-nn	Name and logical number of the hardware that has the error. IOU-00 Input/output unit. MEM-00 Central memory. PROC-0n Central processing unit. n=logical number.
rrrr	Register name.
cc	Register content in hexadecimal notation.

Inform a CE when a fatal error occurs.

The ENTER DATE and ENTER TIME prompts are displayed on the different systems under the following conditions.

1. The operator has selected mainframe initialization on an I2n Class and either:
   a. NOS/VE load was selected, or
   b. the operating system being loaded supports CTI as primary source of current date and time.
2. The Two Port Mux wall clock data on an I1n or any I4n Class system is invalid and either 1a or 1b is true.

NOTE

The smallest unit of time that can be written to the Two Port Mux is minutes. If clock accuracy to within 1 second is desired, the operator should enter the desired seconds. However, this causes CTI to delay to the next minute before writing the clock and continuing the deadstart.

If clock accuracy to within 1 minute is sufficient, the operator can enter 00 seconds and CTI writes the clock without delaying the deadstart. Anytime the time entry is hh hours, 59 minutes, ss seconds, CTI writes the clock as hh:59:00.

Since I2 systems do not have a wall clock present in the Two Port Mux, any valid time entry is permitted and will be saved on the CIP deadstart device as entered without delaying the deadstart.

Option	Description
O	OS LOAD WITH INTERVENTION. Select this option to: • Execute hardware verification sequences. • Reconfigure mainframe hardware components. • Change the operating system deadstart level or CMRDECK selection (NOS), or CMR selection (NOS/BE), or DCFILE selection (NOS/VE), as specified in the deadstart program. • Select an alternate deadstart device. • Load MDD. • Toggle OS LOAD STATE (that is, select operating system to be loaded [NOS-NOS/VE, or NOS/VE]). • Reload CM from EDD tape (option will not be displayed if MRT on disk is not valid). Refer to the Operator Intervention display, display 2-3, later in this section for more information.
U	UTILITIES. Select this option to: • Perform EDD. • Perform a printer dump. • Deadstart CTI from a different device. • Define and display default device parameters. • Display CIP component levels. • Initialize the mainframe after power interruption or maintenance activity. • Clear DEL. • Load the MDD in standalone mode. • Clear the central memory flaw table. • Clear the MRT. • Perform disk subsystem microcode load. • Install NOS/VE boot programs. Refer to the UTILITIES display, figure 2-16, later in this section for more information.

Option	Description
M	OFF-LINE MAINTENANCE. This option enables you to execute hardware tests for preventive maintenance or hardware error diagnosis. Information about the option is included in the MSL 15X Reference manual. The contents of word 12 of the deadstart program also affect the M option. Refer to Setting Word 12 in section 5 of this manual. **NOTE** After executing this option, it will be necessary to select the INITIALIZE MAINFRAME option in the UTILITIES display for proper OS loading to occur, if an I1n or I2n IOU is present. Initialization is automatically selected with an I4n IOU.
H	HELP for INITIAL OPTIONS display. When the CC634B console is being used, press H or the HELP key for a description of the initial options.

The CIP version number, ppp- VIII, is displayed at the bottom of the INITIAL OPTIONS display: ppp is mainframe type and III is the CIP release level. At the very bottom of the display, xxxx is the PSR level.

Operator Intervention Display

The OPERATOR INTERVENTION display, figure 2-5, appears when you select option O, OPERATOR INTERVENTION, from the INITIAL OPTIONS display.

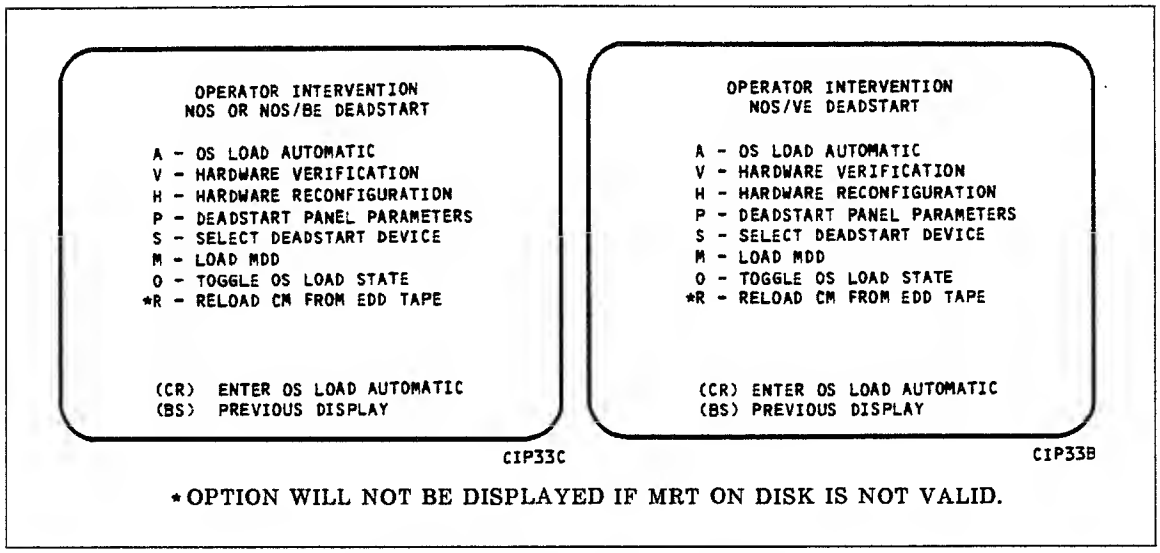


Figure 2-5. Operator Intervention

Option	Description
(CR) or A	OS LOAD AUTOMATIC. Select this option to perform an operating system load. Refer to the description of the OS LOAD AUTOMATIC option on the INITIAL OPTIONS display for more information.
V	HARDWARE VERIFICATION sequence. Select this option to execute PP, CM, and CPU confidence tests. Central memory contents are changed when you execute this option. The V option cannot be executed if a level 3 NOS or NOS/BE deadstart is selected. For NOS/VE a recovery deadstart will not be possible after this option has been executed. **NOTE** After executing this option, it will be necessary to select the INITIALIZE MAINFRAME option in the UTILITIES display for proper OS loading to occur, if an I1n or I2n IOU is present. Initialization is automatically selected with an I4 IOU. You cannot test hardware that has been turned off via option H, HARDWARE RECONFIGURATION. The names of the tests executed are: CMC, CT8, EJP, and MY1. Appendix E includes a brief description of each test.

Option	Description

If an error condition occurs, one of the following messages appears.

```
ERROR PP xx
ERROR CM
ERROR CPU xx
ERROR REG
```

xx indicates the PP or CPU in error. Inform a CE.

Upon successful test completion, the system displays:

```
TESTING COMPLETE-DEADSTART
```

Initiate deadstart after testing to ensure that the system is returned to initial deadstart condition prior to system loading.

H HARDWARE RECONFIGURATION. Select this option to alter the mainframe hardware configuration. When selected, figure 2-6 appears.

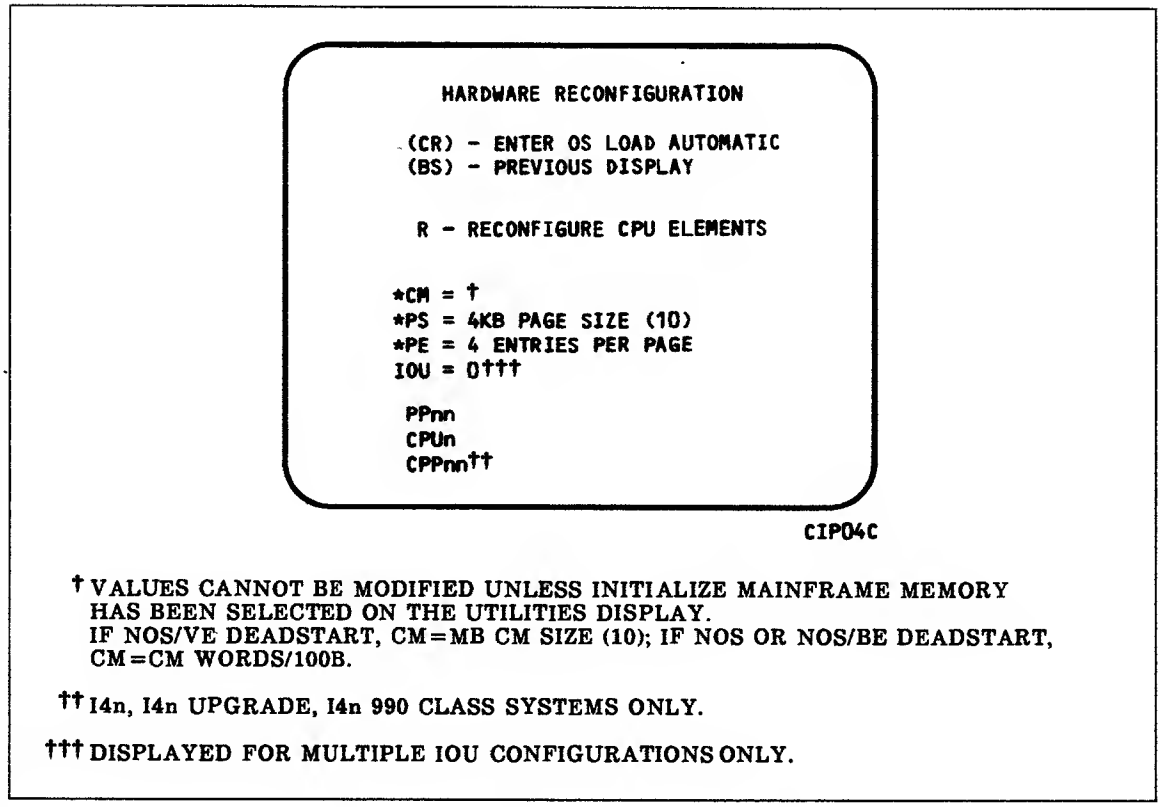
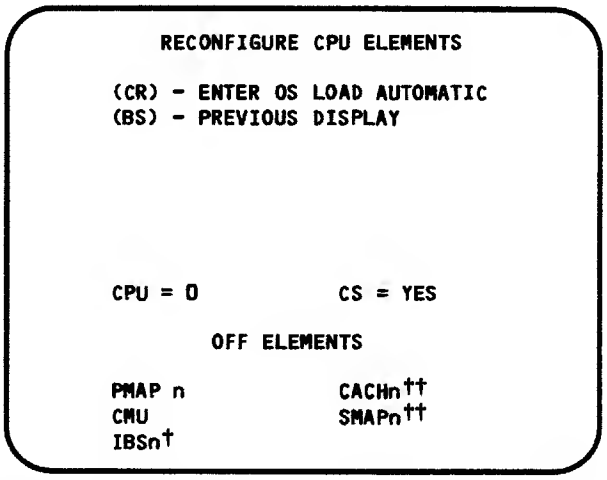


Figure 2-6. Hardware Reconfiguration

Option	Description

The HARDWARE RECONFIGURATION display permits you to reconfigure central memory elements. To reconfigure CPU elements, enter an R while displaying the HARDWARE RECONFIGURATION display to select the RECONFIGURE CPU ELEMENTS display. The RECONFIGURE CPU ELEMENTS display shown in figure 2-7 permits you to reconfigure CPU elements.



†I4n 990 CLASS SYSTEMS ONLY.

††I4n, I4n UPGRADE, I4n 990 and I2n CLASS SYSTEMS ONLY.

Figure 2-7. Reconfigure CPU Elements for I1n, I2n, and All I4n Class Systems

The default hardware configuration includes every hardware element available for use. To change the hardware configuration, enter the appropriate entry on the HARDWARE RECONFIGURATION or RECONFIGURE CPU ELEMENTS display as described in table 2-1. When you turn off an element, its identifier is added to the OFF ELEMENTS list on the display. Entries are in the form keyword=option.

Table 2-1. Hardware Reconfiguration Entries

Keyword	Option	Display[1]	Function
CM=[2]	nnnnnnn	*1	Specifies the size, in octal (for NOS or NOS/BE), of central memory in hundreds of words or in decimal (for NOS/VE). The following examples show the value you enter for nnnnnnn, given the central memory size for NOS, NOS/BE, or NOS/VE.

Central Memory Size in Decimal Words	Central Memory Size in Megabytes	nnnnnnn
131K	1	4000
262K	2	10000
524K	4	20000
1048K	8	40000
2097K	16	100000
4195K	32	200000
8390K	64	400000
16780K	128	1000000

If you enter CM=0 or do not enter the CM=nnnnnnn parameter, the system sets it to the maximum central memory size available.

If you specify a value for nnnnnnn that exceeds the amount of physical memory, the system sends the following message:

```
UNAVAILABLE
```

If you specify a central memory size that is not large enough for a system deadstart, the system sets the maximum central memory size and the following message appears.

```
INVALID ENTRY
```

1. *1 = HARDWARE RECONFIGURATION display; *2 = RECONFIGURE CPU ELEMENTS display.

2. These values are saved for all deadstarts until changed in the mainframe reconfiguration table for CYBER 180 mainframes. Changing these values also requires selecting INITIALIZE MAINFRAME if not the first OS deadstart.

(Continued)

Table 2-1. Hardware Reconfiguration Entries *(Continued)*

Keyword	Option	Display[1]	Function
CPUn=[2]	OFF/ON	*1	Specifies the logical status of each available CPU. Values for n can be 0 or 1. On a two-CPU system, at least one must be ON. If you enter CPU0=OFF on a one-CPU system, the entry is ignored; the system uses the CPU.
CPU=	n	*2	Specifies the CPU for which you are to reconfigure elements.
PPnn=[2]	OFF/ON	*1	Logically turns OFF/ON one or more peripheral processors. Acceptable values for nn are 3 through 11 (excluding 10) and, if you have them, 20 through 31. Ranges may be specified. For example, PP5-7=OFF.

CPPnn=[2]	OFF/ON	*1	Logically turns OFF/ON one or more I4 CIO peripheral processors. Acceptable values for nn are 0 through 11B. Ranges may be specified. For example, CPP5-7=OFF.
			
			If the IOU installed is not an I4, the system displays the following message:
			
			`INVALID ENTRY`
			
			If the IOU is an I4, but no CIO PPs are installed, the system displays:
			
			`UNAVAILABLE`

IBSn=[2]	OFF/ON	*2	Specifies the logical status of each set of the central processor instruction buffer stack. The value for n can be any number from 0-3 or in the form a-b (a less than b). At least 1 set must be present or `INVALID ENTRY` will be displayed. (Valid for I4n 990 Class systems.)

1. *1 = HARDWARE RECONFIGURATION display; *2 = RECONFIGURE CPU ELEMENTS display.

2. These values are saved for all deadstarts until changed in the mainframe reconfiguration table for CYBER 180 mainframes. Changing these values also requires selecting INITIALIZE MAINFRAME if not the first OS deadstart.

(Continued)

Table 2-1. Hardware Reconfiguration Entries *(Continued)*

Keyword	Option	Display[1]	Function
PMAPn=[2]	OFF/ON	*2	Specifies the logical status of each unit of the central processor page map. The value for n can be any number from 0 to 3. The value for n also can be in the form a-b (a through b); a and b can be any number from 0 to 3, and a is less than b. Turn OFF a page map unit only in the event of a hardware error. System performance degrades when a map unit is turned OFF.
CACHn=[2]	OFF/ON	*2	Specifies logical status of each central processor cache unit. Acceptable values for n are 0 through 3. Ranges may be specified. For example, CACH0-1=OFF. Turn OFF a cache unit only in the event of a hardware error. System performance degrades when a cache unit is turned OFF. Used on I2n and all I4n Class systems only.
SMAPn=[2]	OFF/ON	*2	Specifies logical status of each central processor segment map unit. Acceptable values for n are 0, 1, or 0-1. For example, SMAP0-1=OFF. Used on I2n and all I4n Class systems only. Turn OFF a segment map unit only in the event of a hardware error. When a segment map unit is turned off, system performance degrades.
PS=[2]	xx	*1	Specifies the NOS/VE page size for standalone or dual state deadstarts. The allowable page sizes in decimal kilobytes are 4, 8, 16, 32, and 64 (default=4).
PE=[2]	x	*1	Specifies the NOS/VE entries per page table page for standalone or dual state deadstarts. The allowable values are 2, and 4, 7, and 8 (default=4).

1. *1 = HARDWARE RECONFIGURATION display; *2 = RECONFIGURE CPU ELEMENTS display.

2. These values are saved for all deadstarts until changed in the mainframe reconfiguration table for CYBER 180 mainframes. Changing these values also requires selecting INITIALIZE MAINFRAME if not the first OS deadstart.

(Continued)

Table 2-1. Hardware Reconfiguration Entries *(Continued)*

Keyword	Option	Display[1]	Function
IOUn = ON/OFF	ON/OFF	*1	Specifies the logical status of each available IOU. Values for n can be 0 or 1. If you enter IOU0 = OFF you will receive the message: INVALID ENTRY This applies to multiple IOUs only. The entry is invalid for single IOU systems.
IOU = n	0/1	*1	Specifies the IOU for which you are to reconfigure elements. This applies to multiple IOUs only. The entry is invalid for single IOU systems.
CS=[2]	YES/NO	*2	Specifies whether the system should load the central processor microcode into control store memory. The default is YES for all levels of deadstart. If NO is specified, the system does not load microcode from the deadstart disk into control store; whatever is there is used.

1. *1 = HARDWARE RECONFIGURATION display; *2 = RECONFIGURE CPU ELEMENTS display.

2. These values are saved for all deadstarts until changed in the mainframe reconfiguration table for CYBER 180 mainframes. Changing these values also requires selecting INITIALIZE MAINFRAME if not the first OS deadstart.

Option	Description
P (NOS or NOS/BE)	DEADSTART PANEL PARAMETERS for NOS or NOS/BE. Select this option to change any of the following: the deadstart level, the CMRDECK, or deadstart program words 12 and 14. The DEADSTART PANEL PARAMETERS display, figure 2-8, appears. Table 2-2 lists the keyboard entries that you can make to change the deadstart panel program.

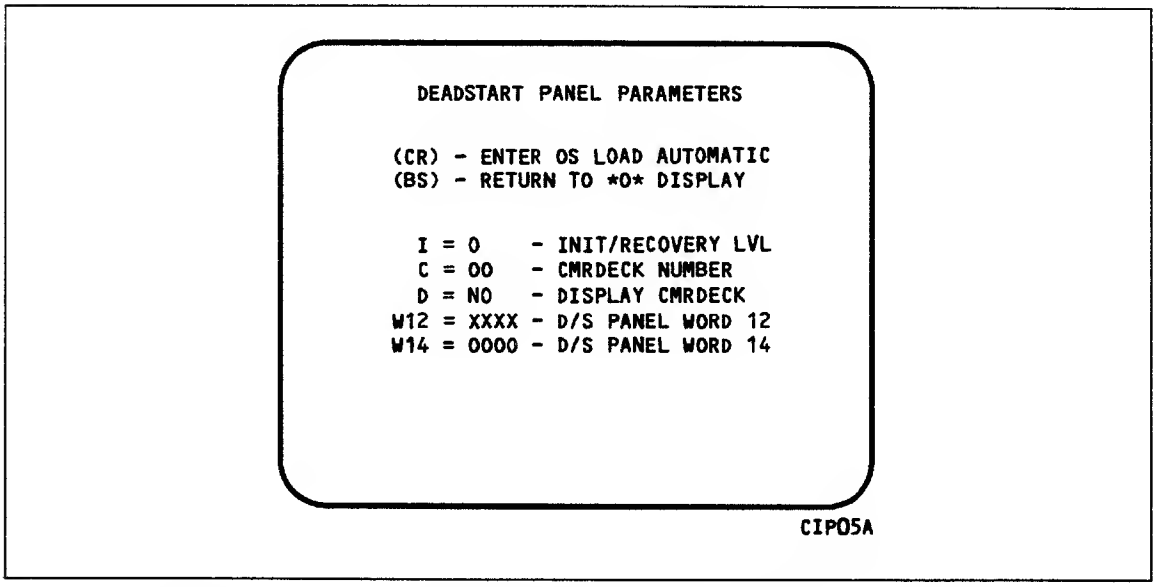


Figure 2-8. Deadstart Panel Parameters for NOS or NOS/BE

Press the carriage return key to cause system deadstart processing to continue with no further intervention on your part. Press the backspace key to return to the OPERATOR INTERVENTION display.

Table 2-2. Keyboard Entries for the Deadstart Panel Parameters Display for NOS or NOS/BE

Keyword	Function
I=x	Specifies the level of deadstart. The value of x can be 0, 1, 2, or 3.
C=xx	Specifies the CMRDECK (CMR for NOS/BE) number. The value of xx can be any number from 0 to 77 octal. Refer to the section 5 for information about CMRDECK/CMR selection.
D=xxx	Entry is not used by NOS/BE. For NOS, specifies whether the CMRDECK is to be displayed. The value of xxx can be YES for display CMRDECK, NO for do not display CMRDECK.
W12=xxxx	Specifies the value for deadstart program word 12. Refer to the section 5 for the proper setting.
W14=xxxx	Specifies the value for deadstart program word 14. Word 14 is reserved for the operating system or maintenance system.

Option	Description
P (NOS/VE)	DEADSTART PANEL PARAMETERS for NOS/VE. Select this option to change the DCFILE or the operator pause entry. The display shown in figure 2-9 appears. Table 2-3 list the keyboard entries that you can make to change deadstart panel (program) parameters for NOS/VE.

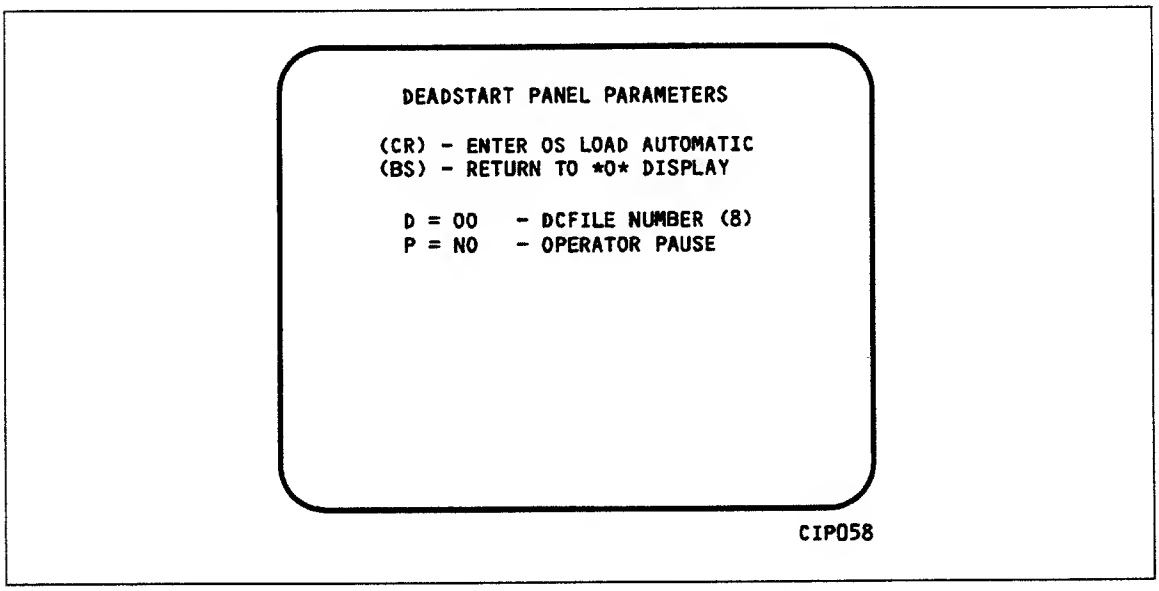


Figure 2-9. Deadstart Panel Parameters for NOS/VE

Table 2-3. Keyboard Entries for the Deadstart Panel Parameters Display for NOS/VE

Keyword	Function
D=xx	Specifies the DCFILE number. The value of xx can be any number from 0 to 77 octal.
P=xxx	Specifies whether a pause will be initiated for operator entries at the NOS/VE Deadstart and Systems Device Configuration Selections menu. The value of xxx can be: YES for Operator Pause NO for Do Not Pause

Option	Description
S	SELECT OS DEADSTART DEVICE. Select this option to specify an alternate disk or a tape device as the OS Load Device (figure 2-10). Press the carriage return key to cause system deadstart processing to continue with no further intervention on your part. You cannot select additional options after this entry. The CIP disk device is therefore the OS device. Press the backspace key to return to the OPERATOR INTERVENTION display.

Entry	Description
T	TAPE DEADSTART. Select this option for OS load from tape rather than from disk. For NOS or NOS/BE deadstarts, the system prompts you for tape device type, channel, equipment, and unit. For NOS/VE deadstarts, the OS load initiates upon selecting this option.
D	ALTERNATE DISK DEADSTART. Select this option to choose an alternate disk device for the OS load device. For NOS or NOS/BE deadstarts, the system prompts you for the disk channel, equipment, and unit. For NOS/VE deadstarts, the OS load initiates upon selecting this option.

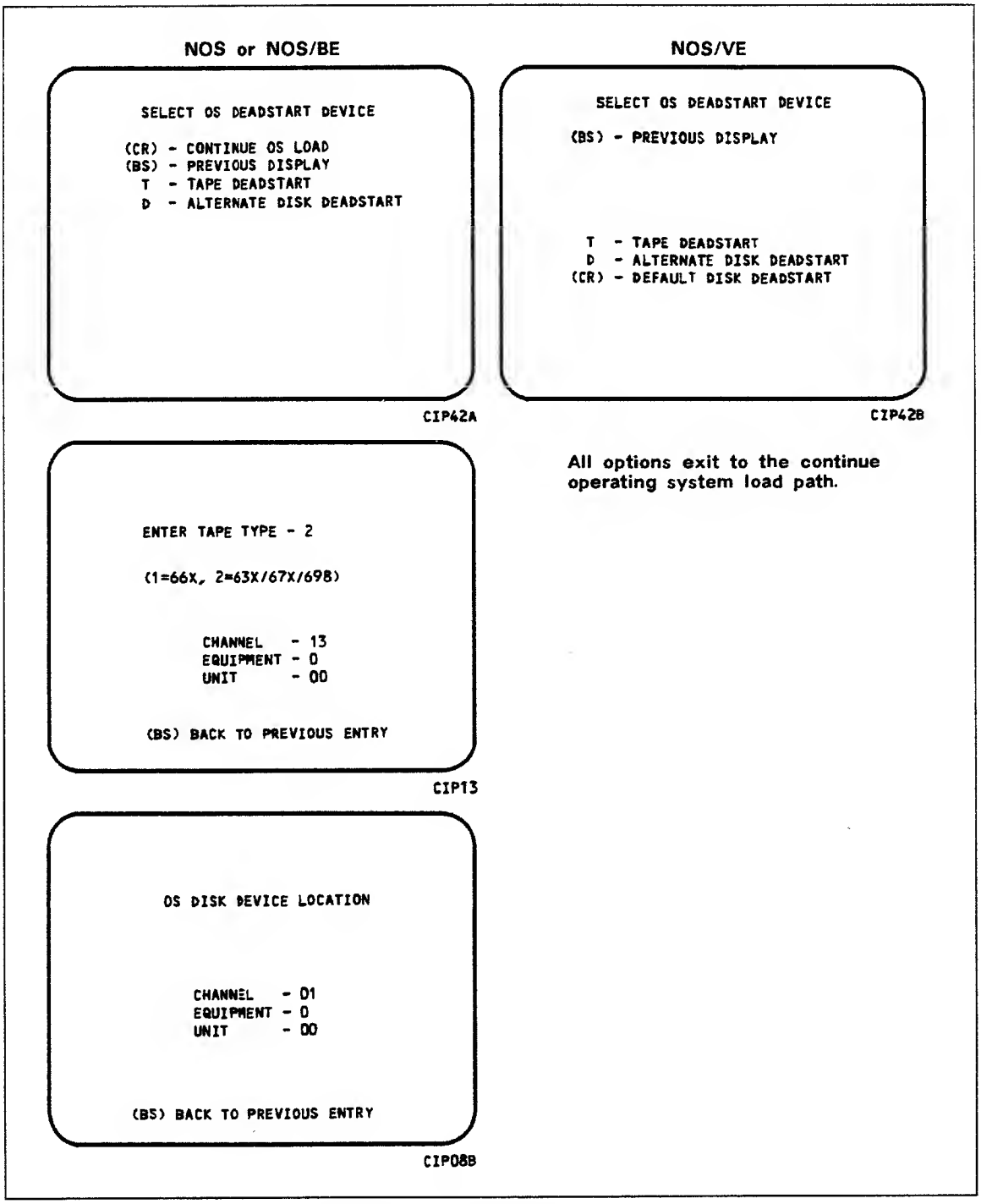


Figure 2-10. Deadstart Device

Option	Description
M	LOAD MDD. This value is saved in MRT for all I1n and all I4n class systems. Select this option to load MDD. The display shown in figure 2-11 appears.

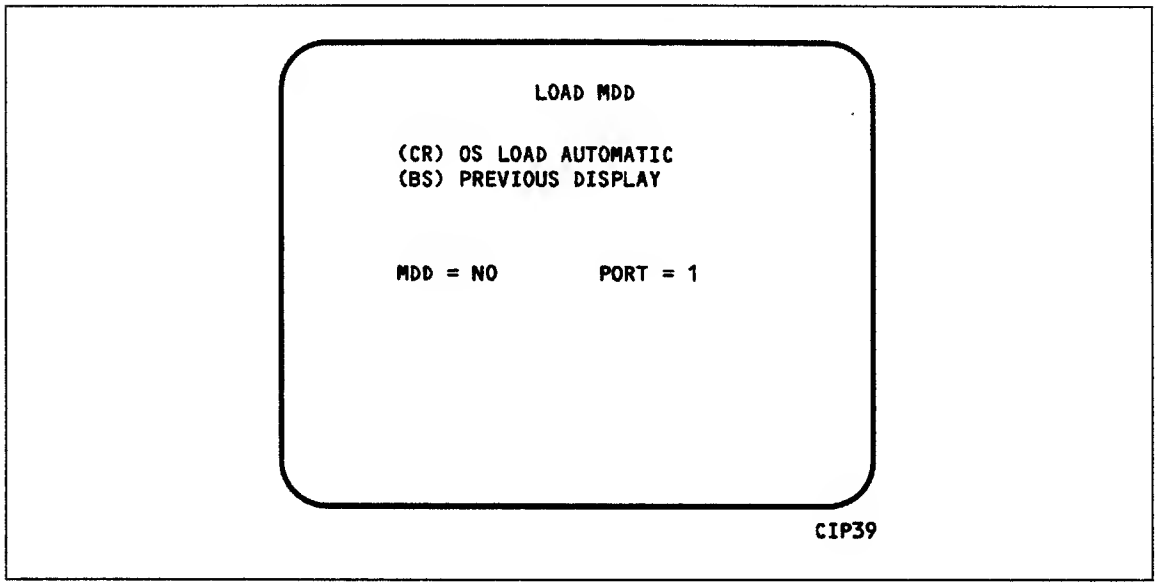


Figure 2-11. Load MDD

Direct the system to load MDD by entering:

```
MDD=YES
```

Select the port number of the two-port multiplexer that MDD uses by entering:

```
PORT = n
```

Parameter n is 0 or 1. The default port number is 0.

NOTE

1. Be sure the baud rate of the specified port of the two-port multiplexer is set properly for the communications being used.

2. Turning on MDD at this time will permanently lock MDD into a PP. The MDD BYE command will have no effect when MDD is loaded via CTI.

Press the carriage return key to cause system deadstart processing to continue with no further intervention on your part.

Press the backspace key to return to the OPERATOR INTERVENTION display.

Option	Description
O	TOGGLE OS LOAD STATE to either a NOS/VE deadstart or a NOS or NOS/BE deadstart. The selected load state is displayed below the OPERATOR INTERVENTION display header. This value is saved in MRT for all I1n, I2n, I4n mainframes. Press the carriage return key to continue system deadstart processing with no further intervention on your part. Press the backspace key to return to the OPERATOR INTERVENTION display.

R	Reload CM/ESM from the specified EDD tape. This allows a recovery/continuation deadstart after any type of maintenance action including a power off, provided that:
	
	• An EDD dump was taken prior to the maintenance action.
	
	• The MRT is valid.
	
	• No logical (MRT) or physical reconfiguration was done since the EDD dump was taken.
	
	• A level 3 recovery has been selected for NOS or NOS/BE or continuation deadstart for NOS/VE.
	
	The EDD tape should be mounted on the tape unit and the tape unit should be ready.
	
	1. The console displays:
	
	`ENTER RELOAD OPTION`
	
	`E - RELOAD ESM ONLY`
	`C - RELOAD CM ONLY`
	`B - RELOAD CM AND ESM`
	
	E Select this option to reload ESM only. (NOS or NOS/BE) A non-zero level deadstart is required. The system will then prompt the operator to:
	
	`ENTER ESM CHANNEL`
	`CHANNEL cc`
	
	The value cc is the channel specified in the default parameter block in the CTI/MSL disk area. After the channel has been entered, the system will prompt the operator for the EDD tape parameters.
	
	C Select this option to reload CM only. For NOS or NOS/BE A level 3 deadstart is required. The system will then prompt the operator for the EDD tape parameters.
	
	B Select this option to reload CM and ESM from the EDD tape. For NOS or NOS/BE a level 3 deadstart is required. The operator will be prompted for the ESM channel and then the EDD tape parameters.

Option	Description

2. EDD tape parameters

   The console displays:

```
CM/ESM RELOAD DEVICE TYPE-m

1=667, 669       (800 BPI)
2=667            (800 BPI)
  639, 679, 698 (1600 BPI)
3=639, 679, 698 (6250 BPI)
```

   The value m is the device type specified in the default parameter block of the CTI/MSL disk area. If the default parameter block is not present, zeros are displayed.

3. Press the carriage return key to use the device type being displayed or enter a 1, 2, or 3 and then press the carriage return key to specify an alternate device. The console displays:

```
CM/ESM RELOAD DEVICE TYPE-m

CHANNEL-cc

(BS) - BACK TO PREVIOUS ENTRY
```

   The value cc is the channel specified in the default parameter block in the CTI/MSL disk area. If the parameter block is not present, zeros are displayed.

4. Press carriage return key to use the channel being displayed or enter the two-digit channel number of the tape unit to which memory is to be reloaded from and press the carriage return key. The console displays:

```
CM RELOAD DEVICE TYPE-m
CHANNEL-cc
EQUIPMENT-e

(BS) - BACK TO PREVIOUS ENTRY
```

   The value e is the equipment number specified in the default parameter block in the CTI/MSL disk area. If the default parameter block is not present, zeros are displayed.

Option	Description

5. Press the carriage return key to use the equipment number displayed or enter the equipment number and press the carriage return key. The console displays:

```
CM RELOAD DEVICE TYPE-m
CHANNEL-cc
EQUIPMENT-e
UNIT-uu

(BS) - BACK TO PREVIOUS ENTRY
```

   The value uu is the unit number specified in the default parameter block of the CTI/MSL disk area. If the default paramater block is not present, zeros are displayed.

6. Press the carriage return key to use the unit number displayed or enter the two-digit unit number and press the carriage return key.

   CTI will return to the OPERATOR INTERVENTION display, figure 2-3, appending the appropriate message to the bottom of the display:

```
CM WILL BE RELOADED FROM EDD TAPE

ESM WILL BE RELOADED FROM EDD TAPE

CM AND ESM WILL BE RELOADED FROM EDD TAPE
```

Utilities Display

Selecting the U option from the INITIAL OPTIONS display causes the UTILITIES display, figure 2-12, to appear.

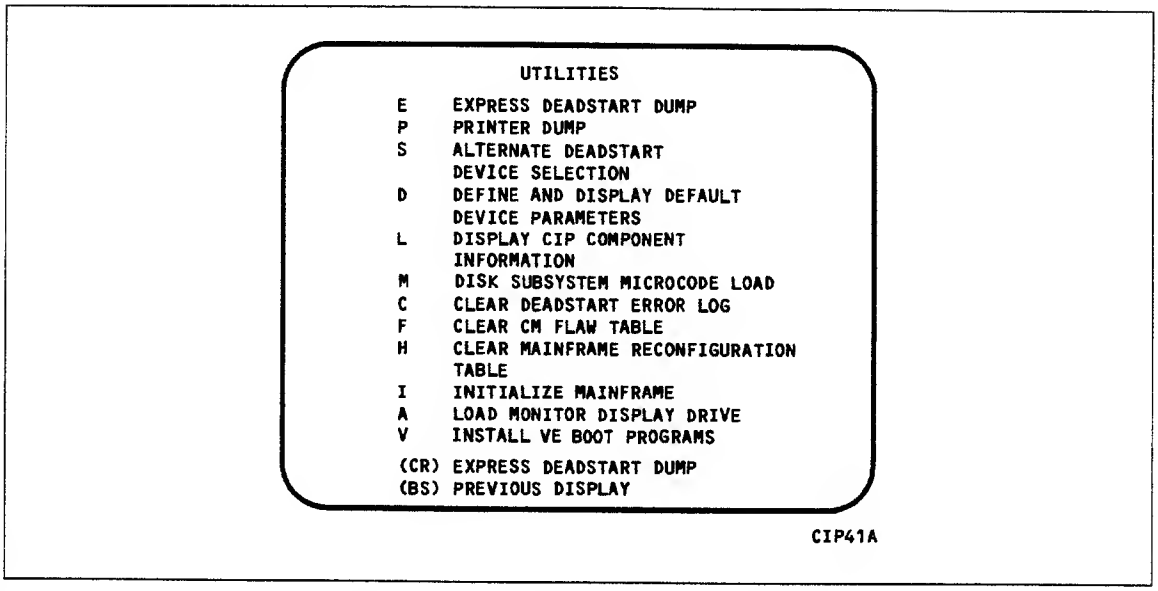


Figure 2-12. Utilities, Disk Deadstart

Option	Description
(CR) or E	EXPRESS DEADSTART DUMP. Select this option to dump to magnetic tape the contents of PP memories, central memory, unified extended memory, CPU hardware registers, maintenance registers, processor control store memories, and the tape and disk controlware. Refer to Performing an Express Deadstart Dump in section 6 for procedures and further information.
P	PRINTER DUMP. Select this option to dump central memory, PP memory, or maintenance register contents to a line printer. When you specify P, the appropriate DUMP TO PRINTER OPTIONS display, figure 2-13 or 14 appears. You cannot return to the UTILITIES display from this display. You must redeadstart the system. Table 2-4 is an alphabetic list of the keyboard entries for performing a printer dump. Refer to Performing a Printer Dump in section 6 for procedures and further information.

NOTE

When the E or P options are selected, CTI will check the error status of all the system elements. If errors are encountered, CTI will log the errors in the DEL. If the DEL is full, CTI will display the errors before allowing the deadstart to continue.

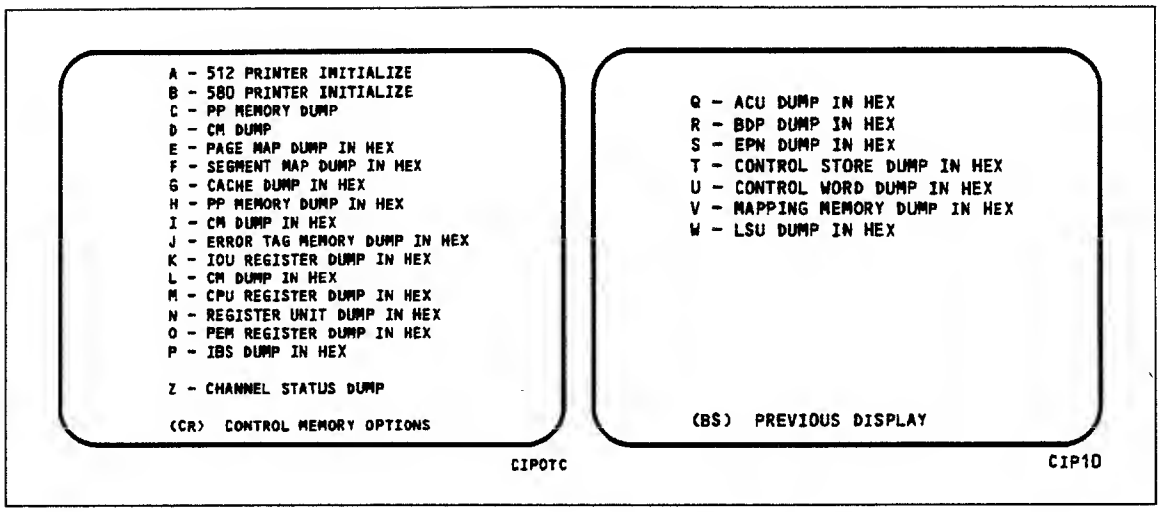


Figure 2-13. Dump to Printer Options for I4n 990 Class Systems, Disk

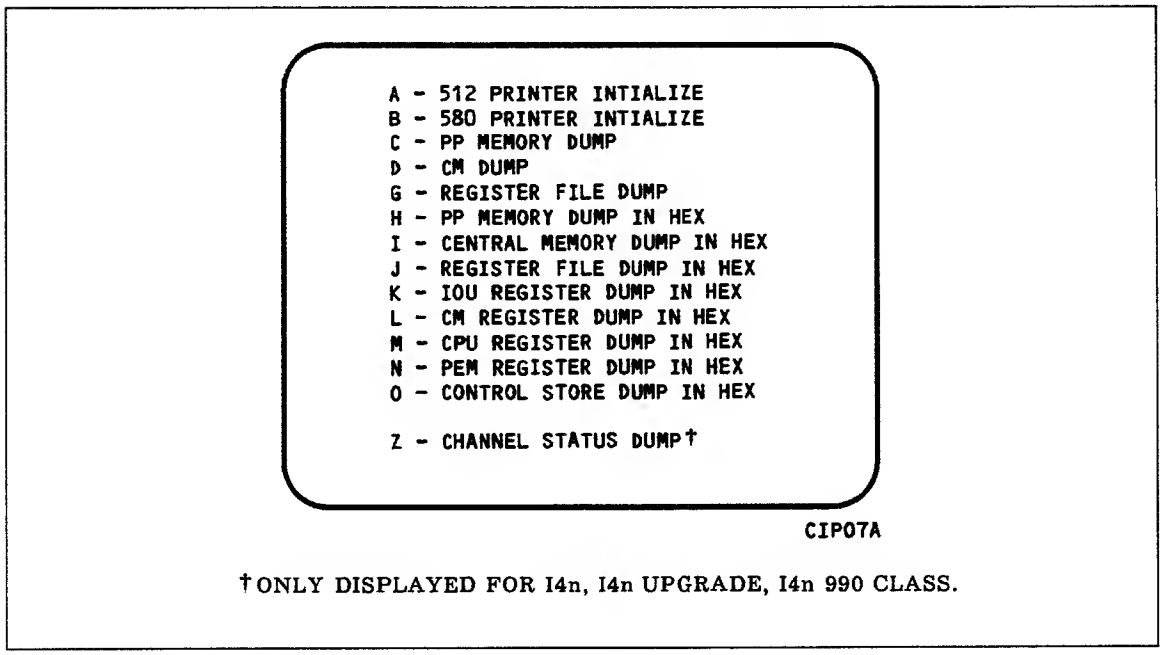


Figure 2-14. Dump to Printer Options for All CYBER Systems Except I4n 990 Class Systems, Disk

Table 2-4. Keyboard Entries for a Printer Dump, I1n, I2n, and All I4n Class Systems, Disk Deadstart

Entry	Function
A	512 PRINTER INITIALIZE. This option initializes the 512 printer image with the data necessary to print with a 512-1 print train.
B	580 PRINTER INITIALIZE. This option initializes the 580 printer buffer image and format buffer image memories.
C[1]	PP MEMORY DUMP. This option provides an octal dump to printer of 12-bit PP memories and 16-bit PP memories with their associated R registers. If the IOU is an I4, the associated P, Q, K, and A register values will also be dumped.
D	CM DUMP. This option provides an octal dump to printer of a selected area of central memory.
E	PAGE MAP DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU Page Map.
F	SEGMENT MAP DUMP IN HEX. This option provides a hexidecimal dump to the printer of the CPU Segment Map.
G	CACHE DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU Cache.
H	PP MEMORY DUMP IN HEX. This option provides a hexadecimal dump to the printer of the PP memories. If the IOU is an I4, the associated P, Q, K, and A register values will also be dumped.
I	CM DUMP IN HEX. This option provides a hexadecimal dump to the printer of a selected area of central memory.
J	REGISTER FILE DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU register file contents.
J[2]	ERROR TAG MEMORY DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU Error Tag Memory contents.
K[1]	IOU REGISTER FILE DUMP IN HEX. This option provides a hexadecimal dump to the printer of the IOU maintenance register contents. If the IOU is an I4, the CIO registers will also be dumped, if installed.
L	CM REGISTER DUMP IN HEX. This option provides a hexadecimal dump to the printer of the contents of the central memory maintenance registers.

1. On multiple IOU systems, IOU0 only is supported.

2. I4n 990 Class systems only.

(Continued)

Table 2-4. Keyboard Entries for a Printer Dump, I1n, I2n, and All I4n Class Systems, Disk Deadstart *(Continued)*

Entry	Function
M	CPU REGISTER DUMP IN HEX. This option provides a hexadecimal dump to the printer of the contents of the CPU maintenance registers. Respond to the message `CPU NO =` by entering the number of the CPU for which registers are to be dumped. If microcode is not executing, the program dumps only the hardware maintenance registers. In place of the software registers, the following message appears on the printer dump: `MICROCODE HUNG`
N	PEM REGISTER DUMP IN HEX. This option provides a hexadecimal dump of the contents of the PEM registers.
N[1]	REGISTER UNIT DUMP IN HEX. This option provides a hexadecimal dump of the contents of the associated registers.
O	CONTROL STORE DUMP IN HEX. This option provides a hexadecimal dump to the printer of the contents of control store. Respond to the message `CPU NO =` by entering the number of the CPU for which control store is to be dumped.
O[1]	PEM REGISTER DUMP IN HEX. This option provides a hexadecimal dump of the contents of the PEM registers.
P	IBS DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU IBS contents.
Q	ACU DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU ACU contents.
R	BDP DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU BDP contents.
S	EPN DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU EPN contents.
T	CONTROL STORE DUMP IN HEX. This option provides a hexadecimal dump to the printer of the contents of control store followed by a dump of shadow memory, if available.
U[1]	CONTROL WORD DUMP IN HEX. This option provides a hexadecimal dump to the printer of CPU Control Word contents.
	NOTE For any of the CPU DUMP options respond to the message `CPU NO =` by entering the number of the CPU for which registers are to be dumped.

1. I4n 990 Class systems only.

(Continued)

Table 2-4. Keyboard Entries for a Printer Dump, I1n, I2n, and All I4n Class Systems, Disk Deadstart *(Continued)*

Entry	Function
V	MAPPING MEMORY DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU Mapping Memory control memory contents.
W	LSU DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU LSU control memory contents.
Z	CHANNEL STATUS DUMP. This option, available on I4 IOUs only, dumps the status of Parity Error Disable, Active, Full, Channel Flag, and Channel Error for NIO channels 00-31B and, if installed, CIO channels 00-11B. A "0" in the resulting output indicates the corresponding status flag is clear and a "1" indicates the status flag is set.

Option	Description
S	ALTERNATE DEADSTART. Select this option to specify an alternate CIP tape unit or disk device from which to deadstart. The ALTERNATE DEADSTART display, figure 2-15, appears.

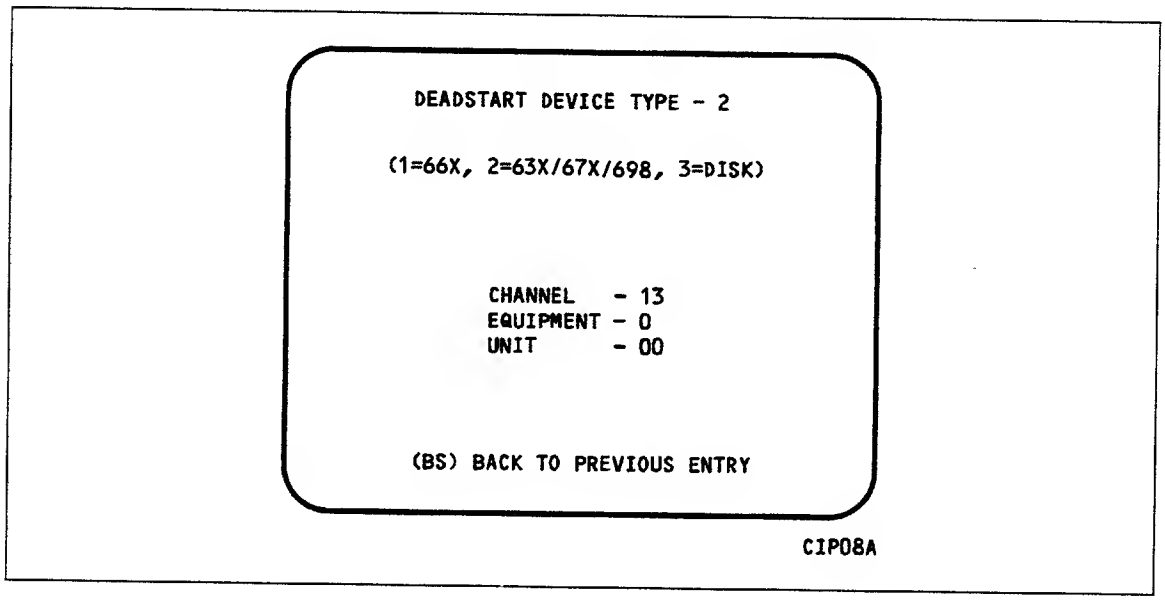


Figure 2-15. Alternate Deadstart

Enter the device type and press the carriage return key. The system then prompts you for channel, equipment, and unit numbers.

Default values are provided for the device parameters. The values are those specified in the default parameter block. The default parameter block is defined through option D, DEFINE AND DISPLAY DEFAULT DEVICE PARAMETERS.

Option	Description

After the device information is entered, press the carriage return key to deadstart from the alternate device.

NOTE

Alternate deadstart from operating system deadstart tapes is not supported for I1n, I2n, and all I4n Class computer systems. To load the operating system from a tape file, select option T, OPERATING SYSTEM FILE ON TAPE, from the OPERATOR INTERVENTION display.

D — DEFINE AND DISPLAY DEFAULT DEVICE PARAMETERS. Select this option to assign default values to the channel, equipment, and unit numbers of a CIP tape deadstart device, disk deadstart device, alternate disk deadstart device, tape dump (EDD) device, ESM channel, or printer dump device. Default values are initially assigned to the device parameters when CIP is installed.

L — DISPLAY CIP COMPONENT INFORMATION. Select this option to display the release levels of the CIP components: microcode, EI, SCD, DFT, MDD, DFT, VE programs, and the valid or invalid status of the DEL, CFT, VCU, SCI, and MRT. An asterisk identifies components that have been installed manually.

I — INITIALIZE MAINFRAME. Select this option to initialize the mainframe after power interruption or maintenance activity. The INITIAL OPTIONS display reappears with the following message on the bottom of the display:

```
ALL MAINFRAME MEMORIES WILL
BE INITIALIZED FOR MSL/OS LOADS
```

Mainframe initialization, including initialization of central memory, PP memory, and maintenance registers, occurs when you select this option and then perform either an operating system load on a level 0, 1, or 2 (not 3) deadstart or select the off-line maintenance option. Refer to section 6 for procedures and additional information about this option.

M — DISK SUBSYSTEM MICROCODE LOAD. Select this option to load peripheral microcode into the 834/836, 844, 885, or 895 disk adapter and control module memory and install peripheral microcode onto specified drives. Refer to Loading and Installing Disk Subsystem Microcode in section 6 for procedures and additional information about this option.

C — CLEAR DEADSTART ERROR LOG. Select this option to clear the data in the DEL.

F — CLEAR CM FLAW TABLE. Select this option to clear the data in the CM flaw table.

Option	Description
H	CLEAR MAINFRAME RECONFIGURATION TABLE. Select this option to clear the mainframe reconfiguration table data stored on disk. When you specify H, the following warning appears:

```
CLEARING THE MRT WILL CAUSE THE FOLLOWING ITEMS ON THE NEXT DEADSTART,

    ALL MAINFRAME MEMORIES WILL
    BE INITIALIZED FOR OS LOADS

    CM/ESM RELOAD FROM EDD TAPE OPTION
    WILL NOT BE AVAILABLE.

(CR) TO CONTINUE
(BS) BACKSPACE TO PREVIOUS DISPLAY
```

NOTE

Beginning with CIP Version 7, clearing the MRT forces a memory initialization by CTI. This was made necessary because with CM reload, CTI no longer writes CM (EI and the CIP Directory) on recovery deadstarts. This requires that the first word address (FWA) of the CIP buffer be maintained in the MRT.

A — LOAD THE MONITOR DISPLAY DRIVER. Select this option to execute MDD in a standalone mode (not concurrent with the operating system).

When you specify A, the MDD PARAMETERS display, figure 2-16, appears.

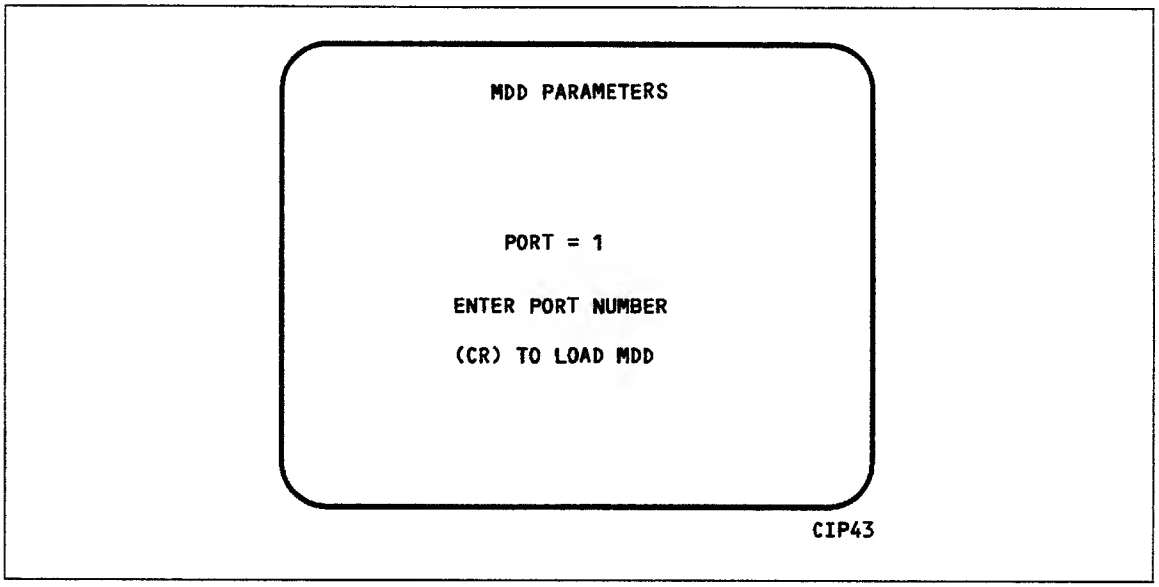


Figure 2-16. MDD Parameters

Option	Description

Enter the port number if different than the one displayed. Press the carriage return key to cause MDD to load. When you have finished using MDD, a deadstart is required. Refer to section 7 for the uses of MDD.

This option is used to support the analysis of the state of a mainframe after encountering a system interrupt. It should only be selected after an operating system has been previously loaded. CTI loads MDD out of central memory (stored there on a system load) and issues the following message, if a checksum of the MDD program from central memory fails.

```
UNABLE TO LOAD MDD.

THE INTEGRITY OF CENTRAL MEMORY
HAS BEEN COMPROMISED.
```

V INSTALL NOS/VE BOOT PROGRAMS. Select this option to install or replace the VE boot programs to the CDA on the CIP device. When you specify the V option, figure 2-17 appears. Enter the path to the device you want the VE boot programs installed on.

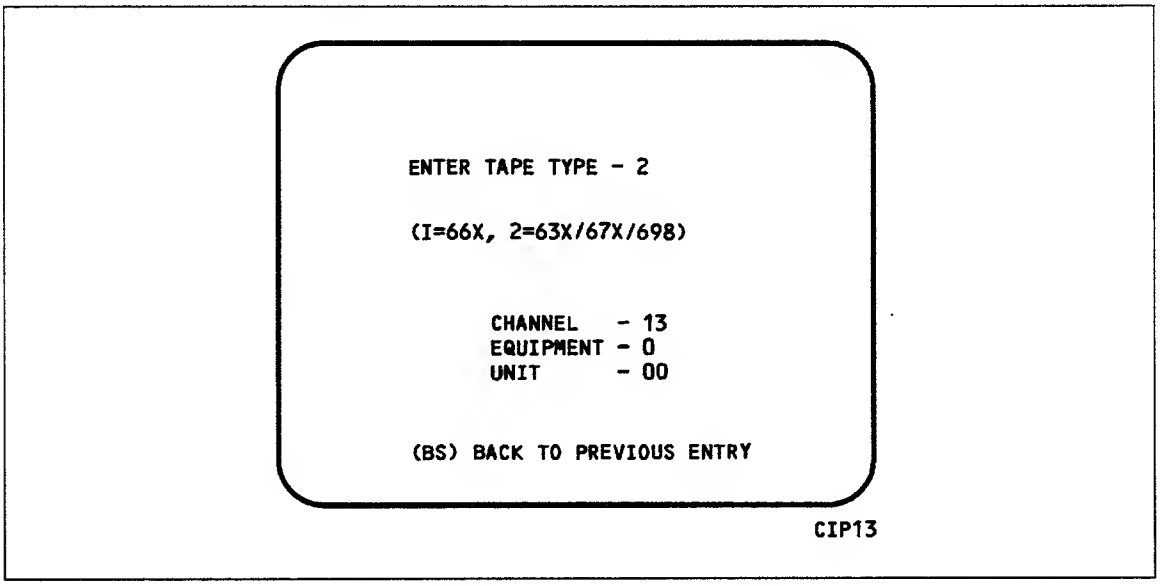


Figure 2-17. Path Select Display

CIP Tape Deadstart Displays, I1n, I2n, and All I4n Class Systems

The CIP tape deadstart displays and options included in this subsection incorporate the following conventions.

- The first option listed on a menu display is the default option. The option can be selected automatically by pressing the carriage return key.
- Help information is provided for the INITIAL OPTIONS display. The HELP display supplies brief information about the options. More detailed option information is given elsewhere in this section.
- Pressing the backspace key allows you to return to the previous display.

Overview

Figures 2-18, 2-19, and 2-20 provide overviews of the displays and options available during a deadstart from CIP tape on I1n, I2n, and all I4n Class systems.

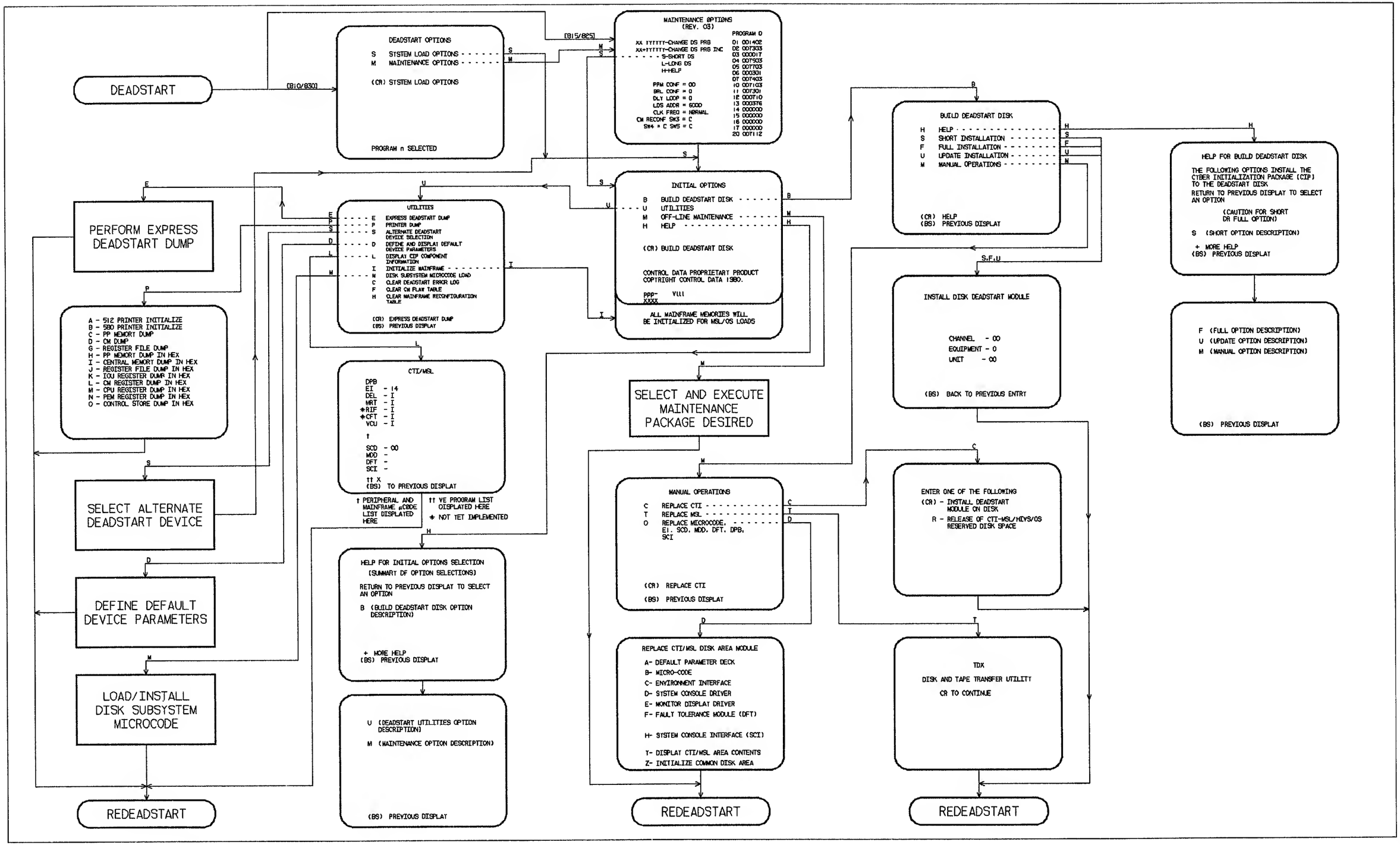


Figure 2-18. Overview of Displays for I1n Class Systems, Deadstart From Tape

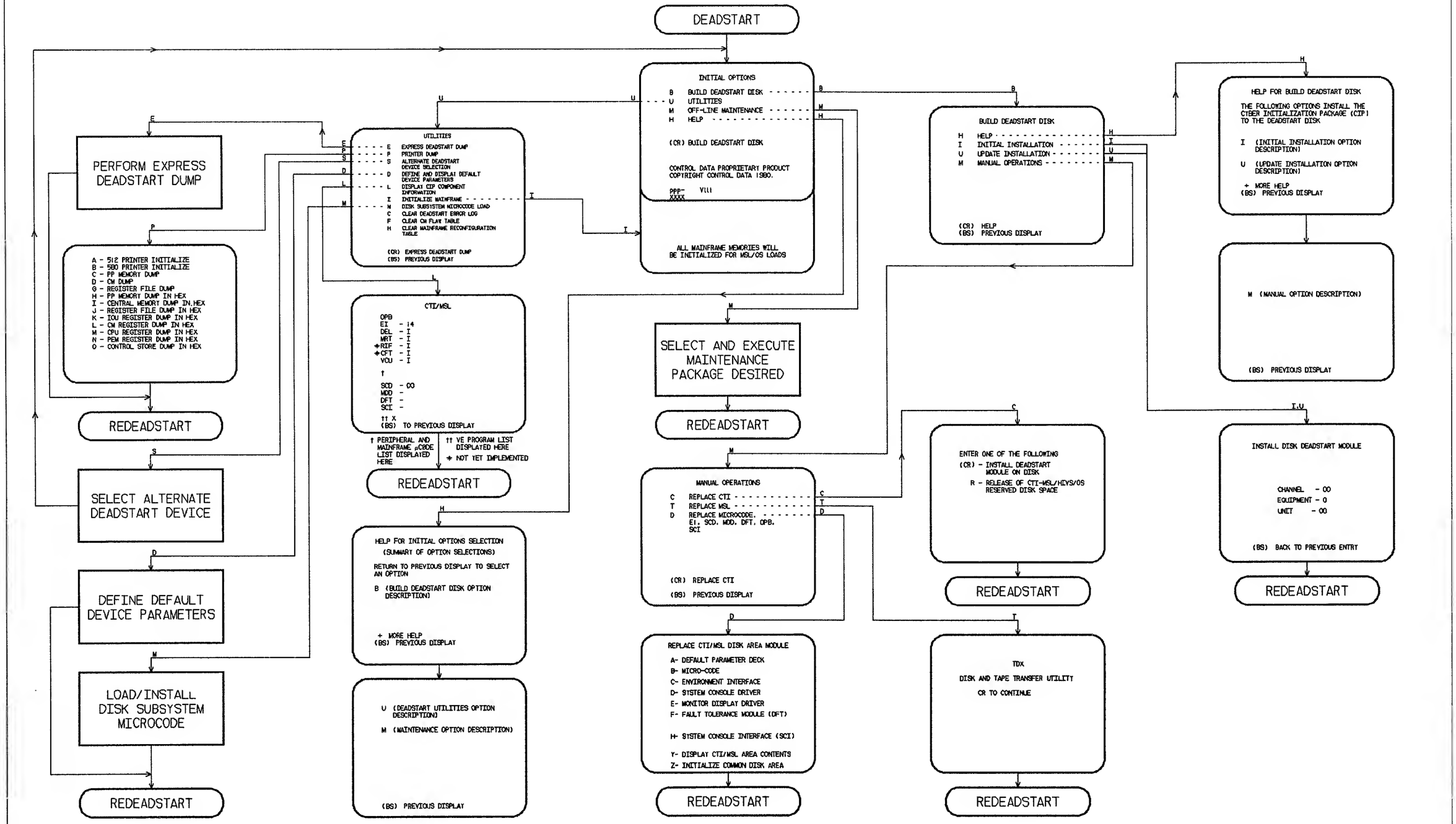


Figure 2-19. Overview of Displays for I2n Class Systems, Deadstart From Tape

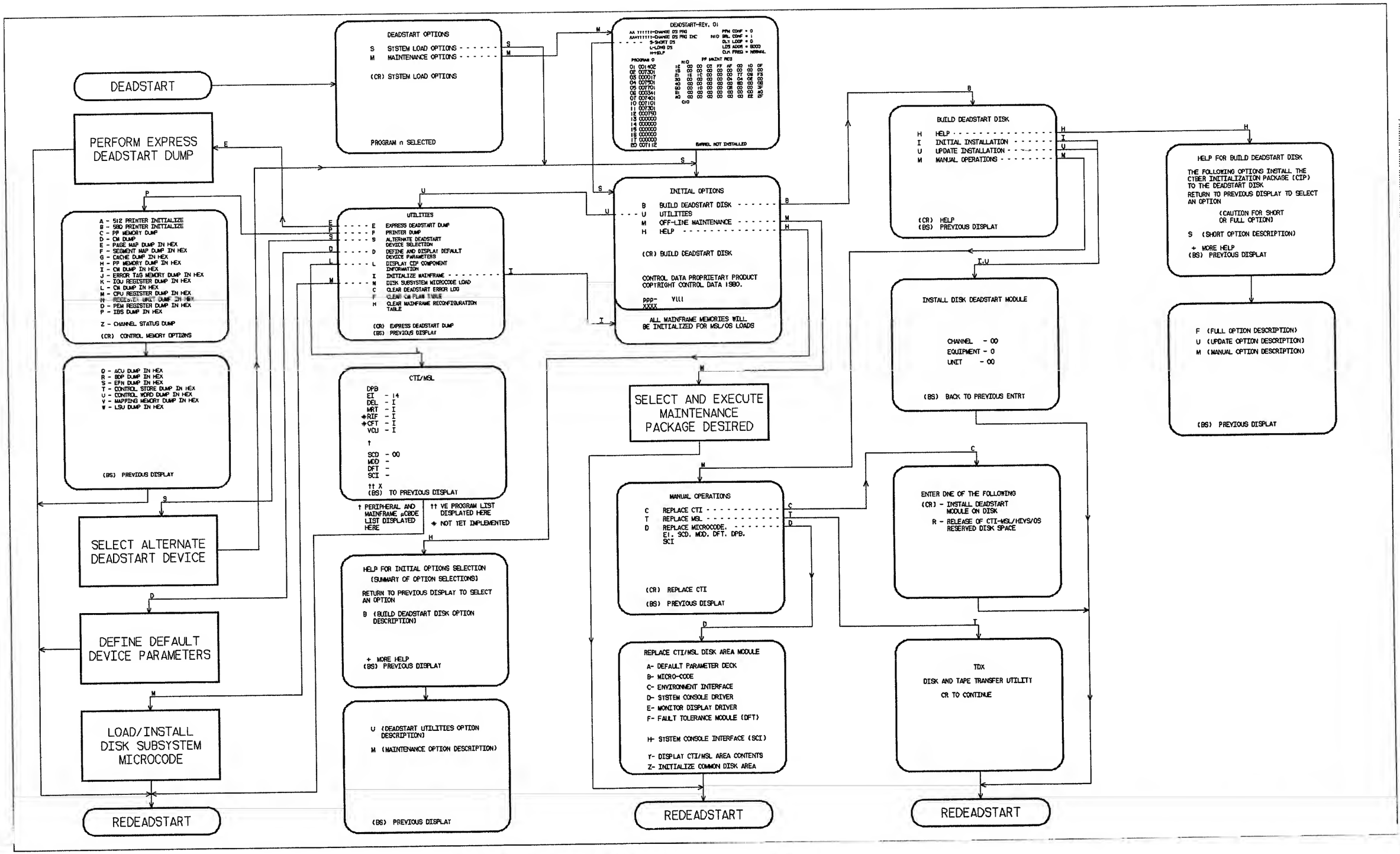


Figure 2-20. Overview of Displays for I4n Class Systems, Deadstart From Tape

Initial Options Display

The INITIAL OPTIONS display, figure 2-21, is the first screen that appears after the deadstart program is initiated. When the deadstart program is set for deadstart from the CIP tape, the INITIAL OPTIONS display provides utilities to install the CIP to disk. A CIP tape deadstart also allows execution of several utilities from tape should the deadstart disk be unusable.

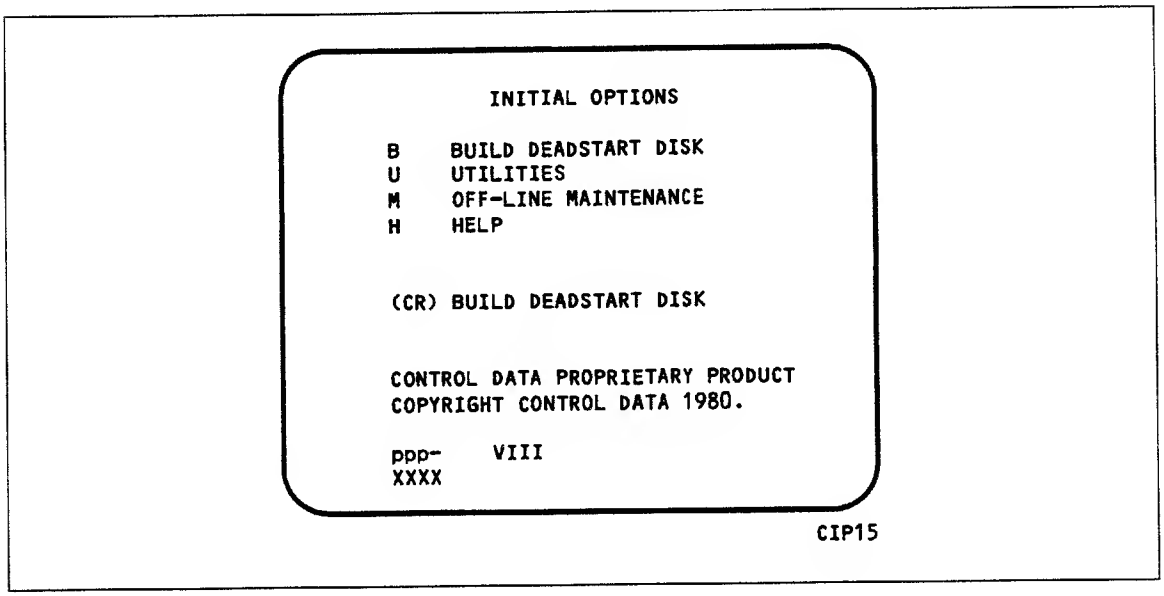


Figure 2-21. Initial Options From CIP Tape

Option	Description
(CR) or B	BUILD DEADSTART DISK. This option allows you to install CIP to disk. The CIP modules must reside on the disk before an operating system deadstart can be performed. CIP modules are used to initialize the mainframe and establish the operating environment. Refer to CIP Installation earlier in this section.

Option	Description
U	UTILITIES. Select this option to: • Perform EDD. • Perform a printer dump. • Deadstart from a different device. • Define and display default device parameters. • Display CIP component levels. • Initialize the mainframe after power interruption or maintenance activity. • Clear DEL. • Load the MDD in standalone mode. • Clear the central memory flaw table. • Clear the MRT. • Perform subsystem microcode load.
M	OFF-LINE MAINTENANCE. This option is provided to enable you to execute hardware tests for preventive maintenance or hardware error diagnosis. Information about the option is included in the MSL 15X Reference manual. The contents of word 12 of the deadstart program also affect the M option. Refer to Setting Word 12 in section 5 of this manual. Execution of the hardware diagnostics from tape is much slower than from disk. Use tape only when your deadstart disk is not usable. **NOTE** After executing this option, it will be necessary to select the INITIALIZE MAINFRAME in the UTILITIES display for proper OS loading to occur; if I1, I1CR or I2 IOU is present. Initialization is automatically selected with an I4 IOU.
H	HELP for INITIAL OPTIONS display. When the CC634B console is being used, press H or the HELP key for a description of the initial options.

The CIP version number, ppp- VIII, is displayed at the bottom of the INITIAL OPTIONS display, where ppp is mainframe type and III is CIP release level. At the very bottom of the display, xxxx is the PSR level.

Build Deadstart Disk Display

The BUILD DEADSTART DISK display, figure 2-22, for I1n Class systems and figure 2-23 for all other models appears when you select option B, BUILD DEADSTART DISK, from the INITIAL OPTIONS display. The BUILD DEADSTART DISK display is available only when you deadstart from the CIP tape. This display provides the options that install the CIP to the deadstart disk. Refer to CIP Installation, earlier in this section, for CIP installation procedures and displays.

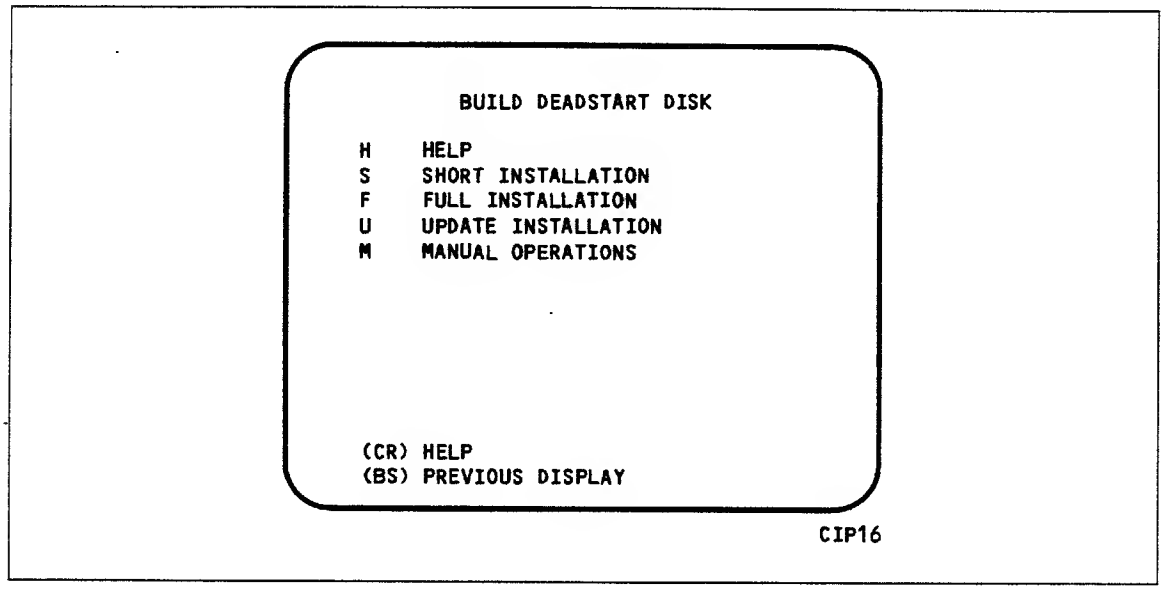


Figure 2-22. Build Deadstart Disk for I1n Class Systems

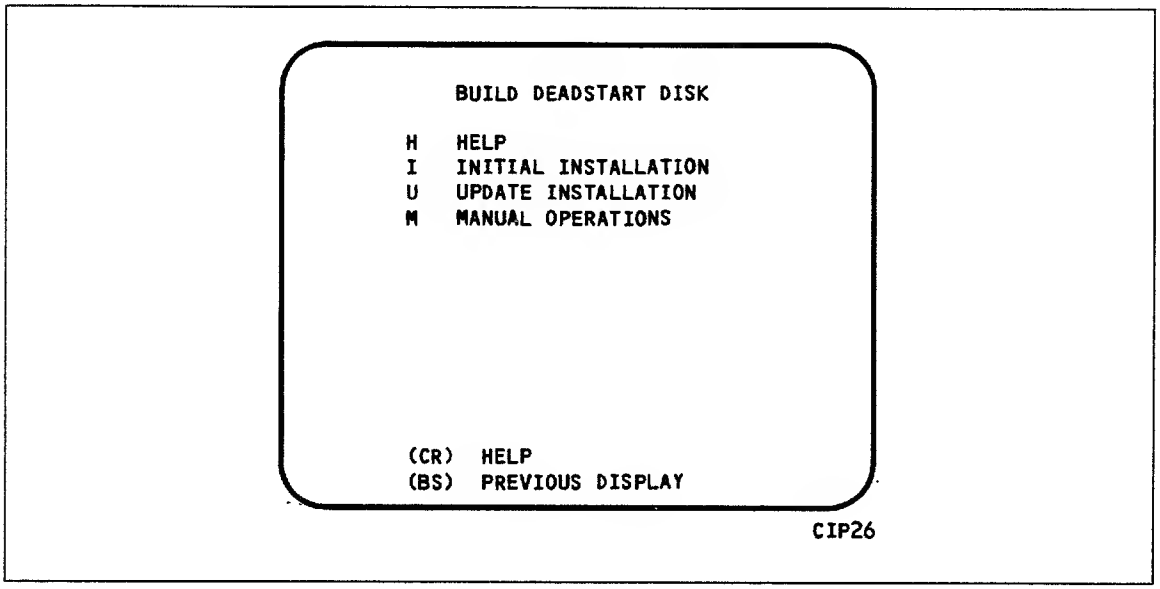


Figure 2-23. Build Deadstart Disk for I2n and All I4n Class Systems

Option	Description
(CR) or H	HELP for Build Option selection. When the CC634B console is being used, press H or the HELP key for a description of the build options.
	CAUTION The INITIAL INSTALLATION, FULL INSTALLATION, and SHORT INSTALLATION options destroy all information on the deadstart disk, except the disk microcode, before installing CIP. Before any S, F, I Installation, be sure you have a backup copy of any information on the deadstart disk that you want to preserve, including operating system permanent files and CE command buffers. After any S, F, I Installation, you must perform an operating system initialization of the disk.
I	INITIAL INSTALLATION. Select this option to initialize the deadstart disk and then install all of CIP to the deadstart disk.
F	FULL INSTALLATION. Select this option to initialize the deadstart disk and then install all of CIP to the deadstart disk. Execute either the short or full option when you install CIP for the first time.
S	The SHORT INSTALLATION option initializes the deadstart disk and installs most of CIP. The CIP tape contains off-line maintenance diagnostics that you use to execute mainframe tests for preventive maintenance or to diagnose a hardware error. The SHORT INSTALLATION option installs a predefined set of diagnostics (diagnostics you use frequently). Those used infrequently can be loaded and executed from the CIP tape when needed. The SHORT INSTALLATION option reserves 15 megabytes of disk storage for the CIP.
U	UPDATE INSTALLATION. Select this option to replace CIP on the deadstart disk some time after the short/full installation. The update option preserves operating system information on the deadstart disk.
M	MANUAL OPERATIONS. Select this option to perform emergency CIP component replacement at any time after CIP has been installed. Figure 2-24, the MANUAL OPERATIONS display, provides manual operation option selection.

Manual Operations Display

The MANUAL OPERATIONS display (figure 2-24) appears when you select option M, MANUAL OPERATIONS, from the BUILD DEADSTART DISK display. Manual operations are available only when you deadstart from the CIP tape.

Manual operations allow manual replacement of individual CIP components, which may be required in the event of a critical problem. Refer to Emergency CIP Repair Procedures - Model 800 Computer Systems in section 6 for repair and manual replacement procedures. More detailed information about manual operations is provided in the MSL 15X Reference manual.

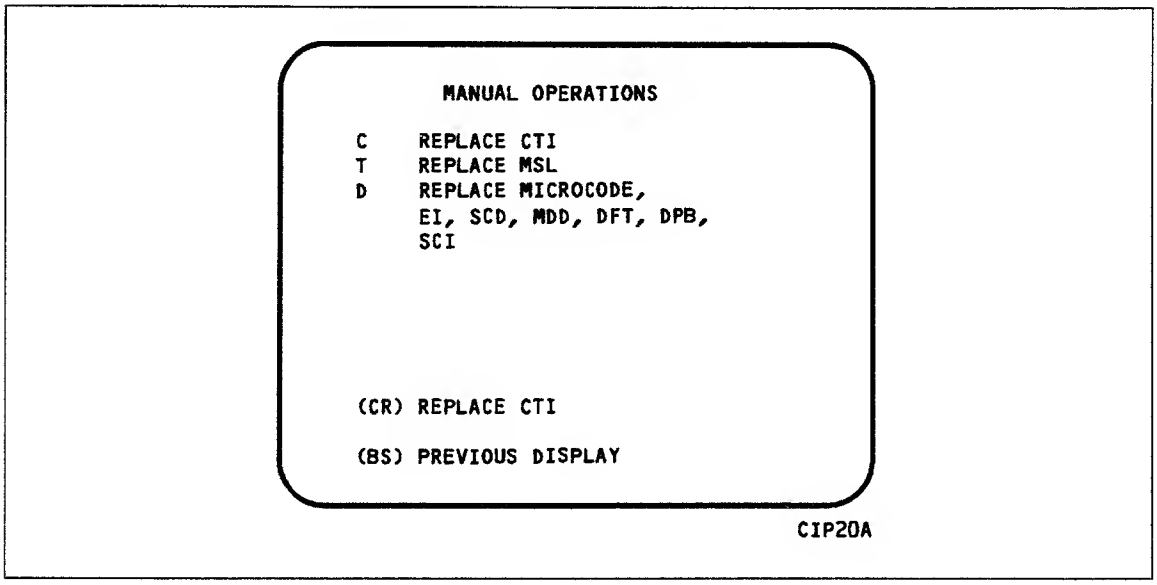


Figure 2-24. Manual Operations

Option	Description
(CR) or C	REPLACE CTI. Select this option to replace the CTI component of CIP to the deadstart disk.
	NOTE This option also provides the capability to release CTI-MSL/HIVS/OS disk space. For detailed procedures, see Build Deadstart Disk Operations in section 6.
T	REPLACE MSL. Select this option to replace the MSL component of CIP on the deadstart disk.

Option	Description
D	REPLACE MICROCODE, EI, SCD, MDD, DFT, DPB, SCI, VE MODULES.

NOTE

Select this option only after an initial install has been performed.

Select this option to replace microcode, EI, the CC634B SCD, MDD, DFT, DPB, SCI, or the NOS/VE boot modules, or to initialize the CDA. When option D is selected, you are prompted to enter the disk channel and disk unit numbers. After you enter the channel and unit numbers or press the carriage return key (CR) to accept the default values shown, the REPLACE CTI/MSL DISK AREA MODULE display shown in figure 2-25 appears. Options A through H manually replace CIP modules in the Common Disk area on the deadstart disk.

Select option Y on the REPLACE CTI/MSL DISK AREA MODULE display to display the level numbers of the programs resident in the Common Disk area of the deadstart disk. If any module has been manually replaced, an asterisk appears by the module name on this display.

Select option Z to initialize the Common Disk area. This option will execute options A through H and will also initialize the following.

- The MRT which identifies the logical state of all mainframe elements. Any of these elements previously defined as logically "OFF" must be redesignated as such.
- The deadstart Error Log.

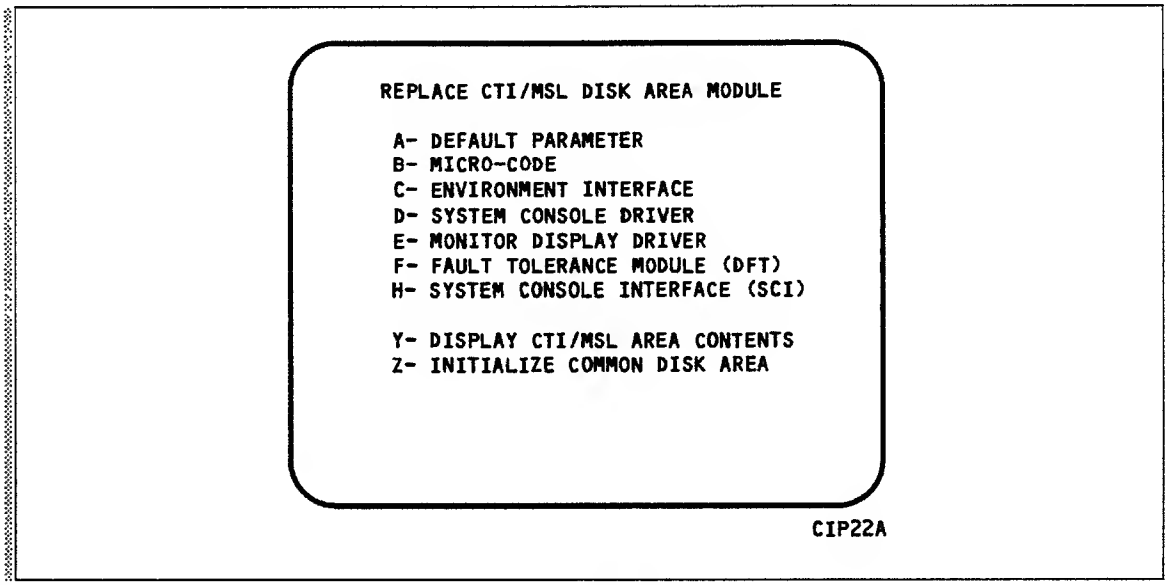


Figure 2-25. Replace CTI/MSL Disk Area Module

Utilities Display

Selecting the U option from the INITIAL OPTIONS display causes the UTILITIES display, figure 2-26, to appear.

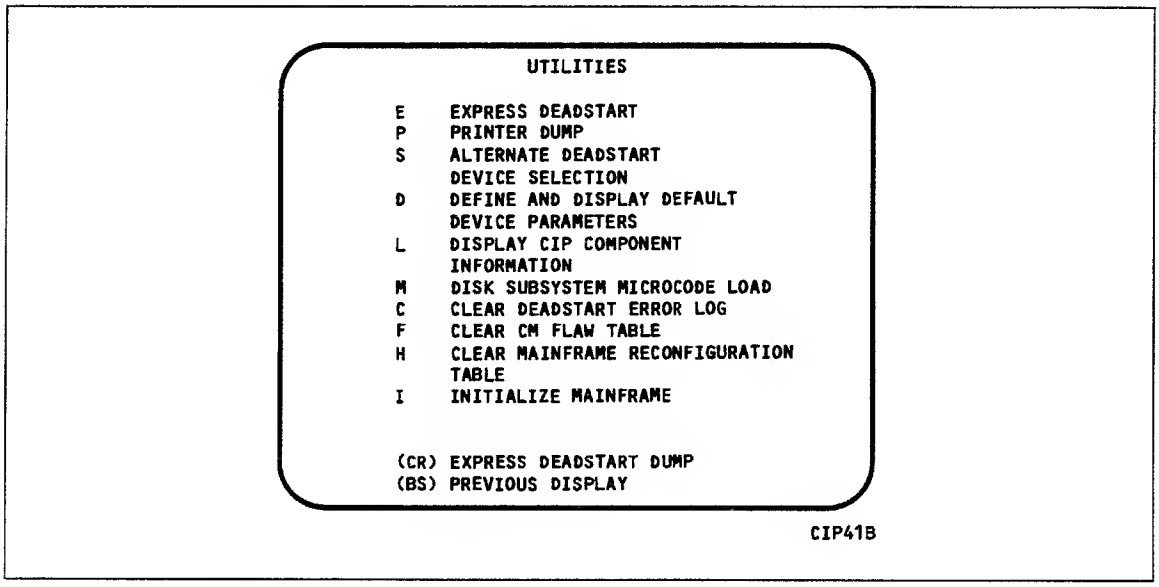


Figure 2-26. Utilities, Tape Deadstart

Option	Description
(CR) or E	EXPRESS DEADSTART DUMP. Select this option to dump to magnetic tape the contents of PP memories, central memory, unified extended memory, CPU hardware registers, maintenance registers, processor control store memories, and the tape and disk controlware. Refer to Performing an Express Deadstart Dump in section 6 for further information.
P	PRINTER DUMP. Select this option to dump central memory, PP memory, or maintenance register contents to a line printer. When you specify P, the appropriate DUMP TO PRINTER OPTIONS display, figure 2-27 or 2-28 (depending on your mainframe configuration) appears. You cannot return to the UTILITIES display from this display. You must redeadstart the system. Table 2-5 lists the keyboard entries for performing a printer dump. For more information refer to Performing a Printer Dump in section 6.

NOTE

When the E or P options are selected, CTI will check the error status of all the system elements. If errors are encountered, CTI will log the errors in the DEL. If the DEL is full, CTI will display the errors before allowing the deadstart to continue.

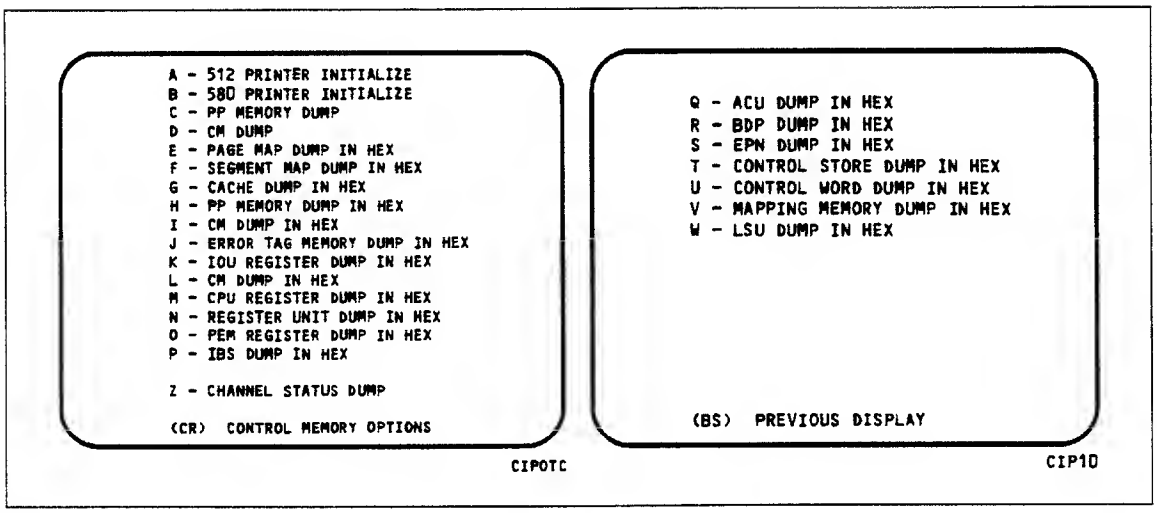
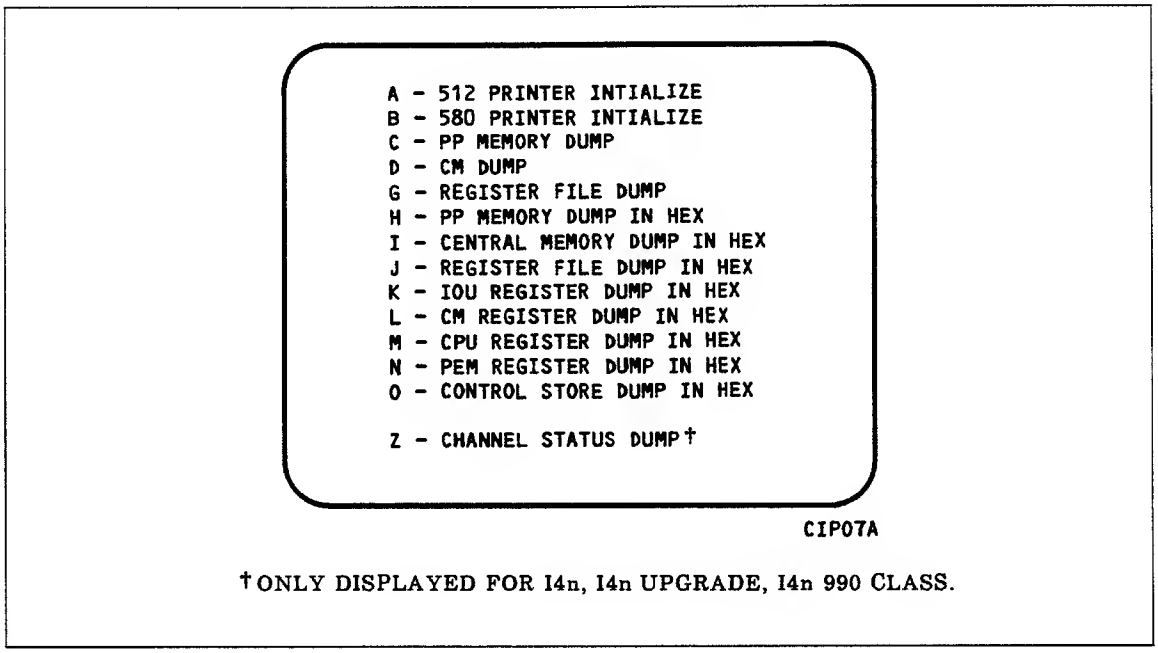


Figure 2-27. Dump to Printer Options for I4n 990 Class Systems, Tape



†ONLY DISPLAYED FOR I4n, I4n UPGRADE, I4n 990 CLASS.

Figure 2-28. Dump to Printer Options for All CYBER Systems Except I4n 990 Class Systems, Tape

Table 2-5. Keyboard Entries for a Printer Dump, I1n, I2n, and All I4n Class Systems, Tape Deadstart

Entry	Function
A	512 PRINTER INITIALIZE. This option initializes the 512 printer image with the data necessary to print with a 512-1 print train.
B	580 PRINTER INITIALIZE. This option initializes the 580 printer buffer image and format buffer image memories.
C[1]	PP MEMORY DUMP. This option provides an octal dump to printer of 12-bit PP memories and 16-bit PP memories with their associated R registers. If the IOU is an I4, the associated P, Q, K, and A register values will also be dumped.
D	CM DUMP. This option provides an octal dump to printer of a selected area of central memory.
E	PAGE MAP DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU Page Map.
F	SEGMENT MAP DUMP IN HEX. This option provides a hexidecimal dump to the printer of the CPU Segment Map.
G	CACHE DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU Cache.
H	PP MEMORY DUMP IN HEX. This option provides a hexadecimal dump to the printer of the PP memories. If the IOU is an I4, the associated P, Q, K, and A register values will also be dumped.
I	CM DUMP IN HEX. This option provides a hexadecimal dump to the printer of a selected area of central memory.
J	REGISTER FILE DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU register file contents.
J[2]	ERROR TAG MEMORY DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU Error Tag Memory contents.
K[1]	IOU REGISTER FILE DUMP IN HEX. This option provides a hexadecimal dump to the printer of the IOU maintenance register contents. If the IOU is an I4, the CIO registers will also be dumped, if installed.
L	CM REGISTER DUMP IN HEX. This option provides a hexadecimal dump to the printer of the contents of the central memory maintenance registers.

1. On multiple IOU systems, IOU0 only is supported.

2. I4n 990 Class systems only.

(Continued)

Table 2-5. Keyboard Entries for a Printer Dump, I1n, I2n, and All I4n Class Systems, Tape Deadstart *(Continued)*

Entry	Function
M	CPU REGISTER DUMP IN HEX. This option provides a hexadecimal dump to the printer of the contents of the CPU maintenance registers. Respond to the message CPU NO = by entering the number of the CPU for which registers are to be dumped. If microcode is not executing, the program dumps only the hardware maintenance registers. In place of the software registers, the following message appears on the printer dump: MICROCODE HUNG
N	PEM REGISTER DUMP IN HEX. This option provides a hexadecimal dump of the contents of the PEM registers.
N[1]	REGISTER UNIT DUMP IN HEX. This option provides a hexadecimal dump of the contents of associated registers.
O	CONTROL STORE DUMP IN HEX. This option provides a hexadecimal dump to the printer of the contents of control store. Respond to the message CPU NO = by entering the number of the CPU for which control store is to be dumped.
O[1]	PEM REGISTER DUMP IN HEX. This option provides a hexadecimal dump of the contents of the PEM registers.
P	IBS DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU IBS contents.
Q	ACU DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU ACU contents.
R	BDP DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU BDP contents.
S	EPN DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU EPN contents.
T	CONTROL STORE DUMP IN HEX. This option provides a hexadecimal dump to the printer of the contents of control store followed by a dump of shadow memory, if available.
U	CONTROL WORD DUMP IN HEX. This option provides a hexadecimal dump to the printer of CPU Control Word contents.
	NOTE For any of the CPU Dump options respond to the message CPU NO = by entering the number of the CPU for which registers are to be dumped.

1. I4n 990 Class systems only.

(Continued)

Table 2-5. Keyboard Entries for a Printer Dump, I1n, I2n, and All I4n Class Systems, Tape Deadstart *(Continued)*

Entry	Function
V	MAPPING MEMORY DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU Mapping Memory control memory contents.
W	LSU DUMP IN HEX. This option provides a hexadecimal dump to the printer of the CPU LSU control memory contents.
Z	CHANNEL STATUS DUMP. This option, available on I4 IOUs only dumps the status of Parity Error Disable, Active, Full, Channel Flag, and Channel Error for NIO channels 00-31B and, if installed, CIO channels 00-11B. A "0" in the resulting output indicates the corresponding status flag is clear and a "1" indicates the status flag is set.

Option	Description
S	ALTERNATE DEADSTART. Select this option to specify an alternate CIP tape unit or disk device from which to deadstart. The ALTERNATE DEADSTART display, figure 2-29, appears.

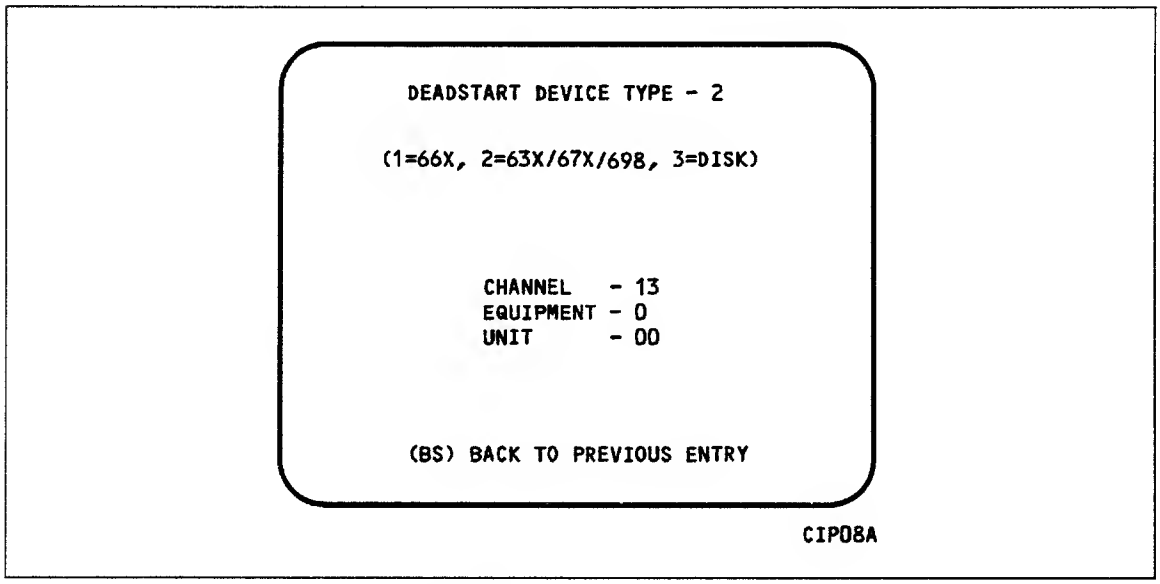


Figure 2-29. Alternate Deadstart

Enter the device type and press the carriage return key. The system then prompts you for channel, equipment, and unit numbers.

Default values are provided for the device parameters. The values are those specified in the default parameter block. The default parameter block is defined through option D, DEFINE AND DISPLAY DEFAULT DEVICE PARAMETERS.

Option	Description

After the device information is entered, press the carriage return key to deadstart from the alternate device.

NOTE

Alternate deadstart from operating system deadstart tapes is not supported for I1n, I2n, and all I4n Class systems. To load the operating system from a tape file, select option T, OPERATING SYSTEM FILE ON TAPE, from the OPERATOR INTERVENTION display.

D — DEFINE AND DISPLAY DEFAULT DEVICE PARAMETERS. Select this option to assign default values to the channel, equipment, and unit numbers of a CIP tape deadstart device, disk deadstart device, alternate disk deadstart device, tape dump (EDD) device, or printer dump device. Default values are initially assigned to the device parameters when CIP is installed.

L — DISPLAY CIP COMPONENT INFORMATION. Select this option to display the release levels of the CIP components: microcode, EI, SCD, MDD, SCI, DFT, NOS/VE programs, and the valid and invalid status of the DEL, CFT, VCU, and MRT. An asterisk identifies components that have been installed manually.

I — INITIALIZE MAINFRAME. Select this option to initialize the mainframe after power interruption or maintenance activity. The INITIAL OPTIONS display reappears with the following message on the bottom of the display:

```
ALL MAINFRAME MEMORIES WILL
BE INITIALIZED FOR MSL/OS LOADS
```

Mainframe initialization, including initialization of central memory, PP memory, and maintenance registers, occurs when you select this option and then perform either an operating system load on a level 0, 1, or 2 (not 3) deadstart or select the off-line maintenance option. Refer to Performing a Power-On Initialization in section 6 for procedures and additional information about this option.

M — DISK SUBSYSTEM MICROCODE LOAD. Select this option to load peripheral microcode into the 834/836, 844, 885, or 895 disk adapter and control module memory and install peripheral microcode onto specified drives. Refer to Loading and Installing Disk Subsystem Microcode From CIP Tape in section 9 for procedures and additional information about this option.

C — CLEAR DEADSTART ERROR LOG. Select this option to clear the data in the DEL.

Option	Description
F	CLEAR CM FLAW TABLE. Select this option to clear the data in the CM flaw table.
H	Clear mainframe reconfiguration table (MRT). Select this option to clear the mainframe reconfiguration table data stored on disk.

```
Clearing the MRT will cause the following items on the next Deadstart,

    ALL MAINFRAME MEMORIES WILL
    BE INITIALIZED FOR OS LOADS

    CM/ESM RELOAD FROM EDD TAPE OPTION
    WILL NOT BE AVAILABLE.

(CR) TO CONTINUE
(BS) BACKSPACE TO PREVIOUS DISPLAY
```

NOTE

Beginning with CIP Ver. 7, clearing the MRT forces a Memory Initialization by CTI. This was made necessary because with CM Reload, CTI no longer writes CM (EI and the CIP Directory) on Recovery Deadstarts. This requires that the first word address (FWA) of the CIP Buffer be maintained in the MRT.

Initial Options Display

The INITIAL OPTIONS display, figure 3-2, always appears first when a deadstart is initiated.

When the deadstart program is set for deadstart from disk, the INITIAL OPTIONS display provides operating system load, execution of off-line maintenance, and deadstart utilities.

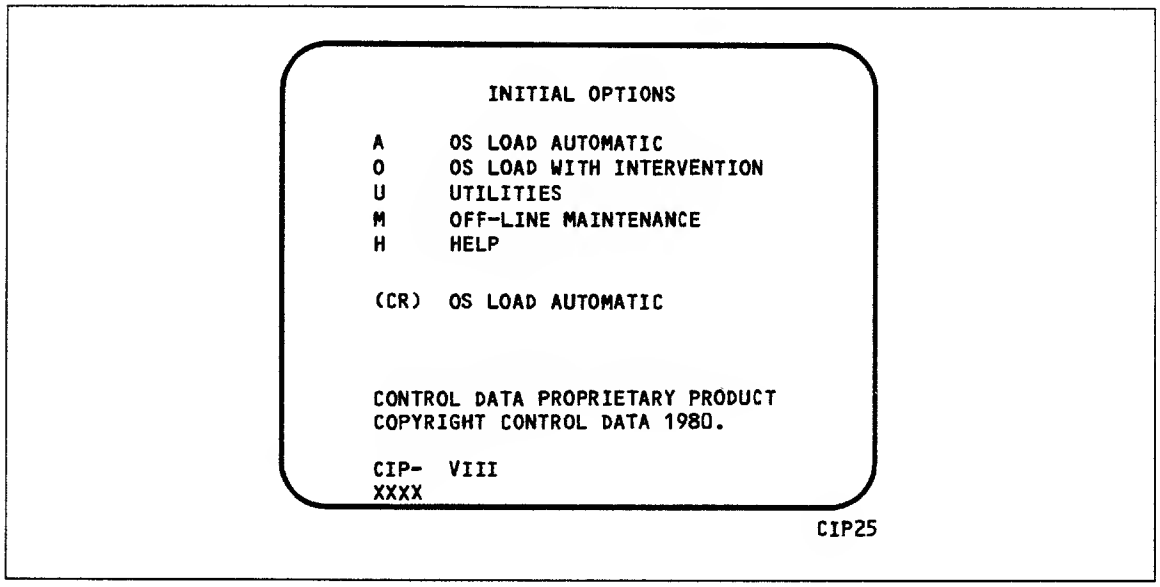


Figure 3-2. Initial Options From Disk

Option	Description

(CR) or A	OS LOAD AUTOMATIC. Select this option to load the operating system with no intervention on your part.
	
	Before CIP transfers deadstart to the operating system, confidence tests verify the ability of PP memory to hold simple data patterns and preset PP memory contents to all ones.
	
	If the system detects a fatal error during confidence testing, the following information appears.
	
	`DEADSTART ABORTED - FATAL ERROR`
	
	`MR-0-2 yyyy yyyy yyyy yyyy yyyy`
	`MR-0-1 yyyy yyyy yyyy yyyy yyyy yyyy`
	`MR-0-0 yyyy yyyy yyyy yyyy yyyy yyyy`
	
	yyyy is the contents of a word in the maintenance register, word 16 is the upper left word, and word 0 is the lower right word. A text explanation of the error appears below the register contents. Inform a CE.

Option	Description
O	OS LOAD WITH INTERVENTION. Select this option to execute the hardware verification sequences, to reconfigure mainframe hardware components, or to change the operating system deadstart level or CMRDECK selection specified in the deadstart program. Refer to the OPERATOR INTERVENTION display, figure 3-3, later in this section for more information.
U	UTILITIES. Select this option to: • Perform EDD. • Perform a printer dump. • Deadstart from a different device. • Define DPB. • Display CIP component information. • Initialize external memory (ESM) after power interruption or maintenance activity. Refer to the UTILITIES display, figure 3-7, later in this section for more information.
M	OFF-LINE MAINTENANCE. This option enables you to execute hardware tests for preventive maintenance or hardware error diagnosis. Information about the option is included in the MSL 140 Reference manual. The contents of word 12 of the deadstart program also affect the M option. Refer to Setting Word 12 in section 5.
H	HELP for INITIAL OPTIONS display.

The CIP version number, CIP- VIII, is displayed at the bottom of the INITIAL OPTIONS display. At the bottom of the display, xxxx is the PSR level.

Initial Options Display

The INITIAL OPTIONS display, figure 3-11, is the first screen that appears after you press the DEADSTART button. When you deadstart from the CIP tape, the INITIAL OPTIONS display provides utilities to install CIP to disk. A CIP tape deadstart also allows execution of several utilities from tape should the deadstart disk be unusable.

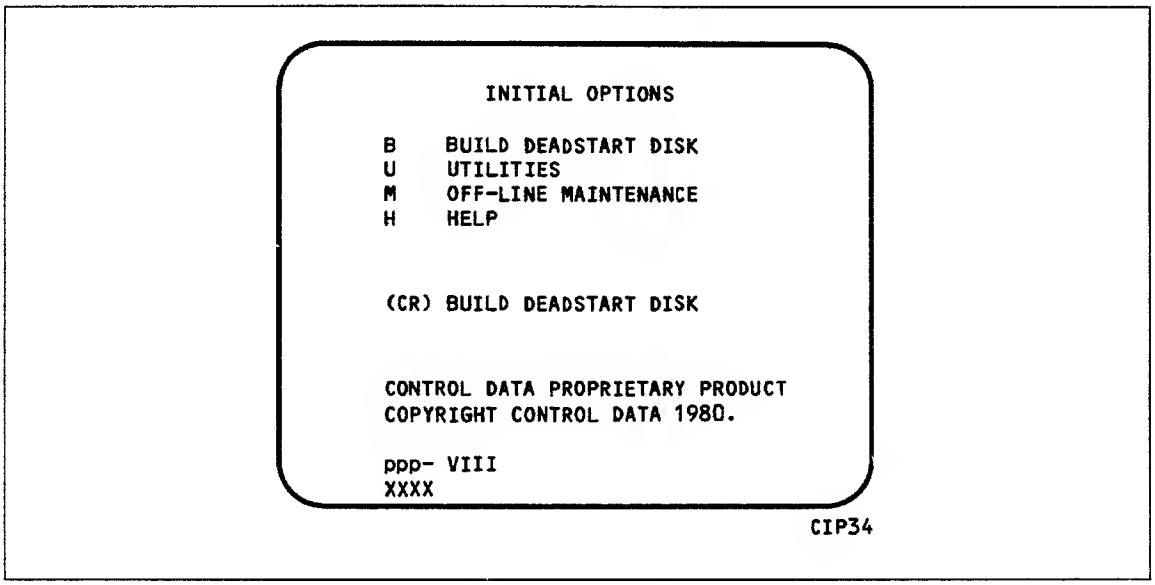


Figure 3-11. Initial Options From CIP Tape

Option	Description
(CR) or B	BUILD DEADSTART DISK. This option allows you to install CIP to disk. CIP modules are used to initialize the mainframe and establish the operating environment. Refer to CIP Installation earlier in this section.
U	UTILITIES. Select this option to: • Perform EDD. • Perform a printer dump. • Deadstart from a different device. • Define DPB. • Display CIP component levels. • Initialize ESM after power interruption or maintenance activity. • Load/install peripheral microcode.

Option	Description
M	OFF-LINE MAINTENANCE. This option is provided to enable you to execute hardware tests for preventive maintenance or hardware error diagnosis. Information about the option is included in the MSL 140 Reference manual. The contents of word 12 of the deadstart program also affect the M option. Refer to Setting Word 12 in section 5 of this manual. Execution of the hardware diagnostics from tape is much slower than from disk. Use tape only when your deadstart disk is not usable.
H	HELP for INITIAL OPTIONS display.

The CIP level number, ppp- VIII, is displayed at the bottom of the INITIAL OPTIONS display. At the very bottom of the display, xxxx is the PSR level.

Initial Options Display

The INITIAL OPTIONS display, figure 4-2, always appears first when a deadstart is initiated.

When the deadstart program is set for deadstart from disk or when the deadstart program is set for deadstart from the OS tape, the INITIAL OPTIONS display provides operating system load and deadstart utilities.

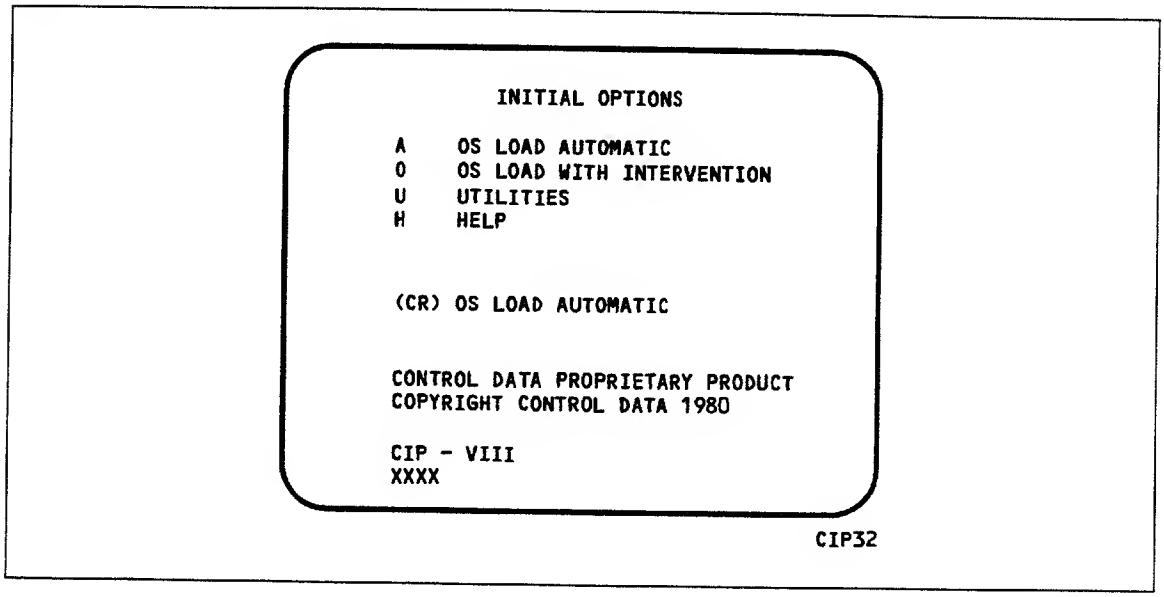


Figure 4-2. Initial Options From Disk or From OS Tape

Option	Description

(CR) or A	OS LOAD AUTOMATIC. Select this option to load the operating system with no intervention on your part.
	
	Before CIP transfers deadstart to the operating system, memory confidence tests verify the ability of central memory and PP memory to hold simple data patterns, and then preset CM and PP memory contents to all ones.
	
	If the system detects a fatal error on a CYBER 170 mainframe during the confidence testing, the following information appears.
	
	`DEADSTART ABORTED - FATAL ERROR`
	
	`SR-0-2 yyyy yyyy yyyy yyyy yyyy`
	`SR-0-1 yyyy yyyy yyyy yyyy yyyy yyyy`
	`SR-0-0 yyyy yyyy yyyy yyyy yyyy yyyy`
	
	yyyy is the contents of a word in the SCR register; word 16 is the upper left word, and word 0 is the lower right word. A text explanation of the error appears below the register contents. Inform a CE.

Option	Description
O	OS LOAD WITH INTERVENTION. Select this option to execute the hardware verification sequences, to reconfigure mainframe hardware components, or to change the operating system deadstart level or CMRDECK selection specified in the deadstart program. Refer to the OPERATOR INTERVENTION display, figure 4-3, for more information.
U	UTILITIES. Select this option to: • Perform an EDD. • Perform a printer dump. • Deadstart from a different device. • Define DPB. • Display CIP component information. • Initialize ESM after power interruption or maintenance activity.
H	HELP for INITIAL OPTIONS display.

The CIP version number, CIP- VIII, is displayed at the bottom of the INITIAL OPTIONS display. At the very bottom of the display, xxxx is the PSR level.

Initial Options Display

The INITIAL OPTIONS display, figure 4-11, is the first screen that appears after deadstart is initiated. When you deadstart from CIP tape, the INITIAL OPTIONS display provides utilities to install the CIP to disk. A CIP tape deadstart also allows execution of several utilities from tape should the deadstart disk be unusable.

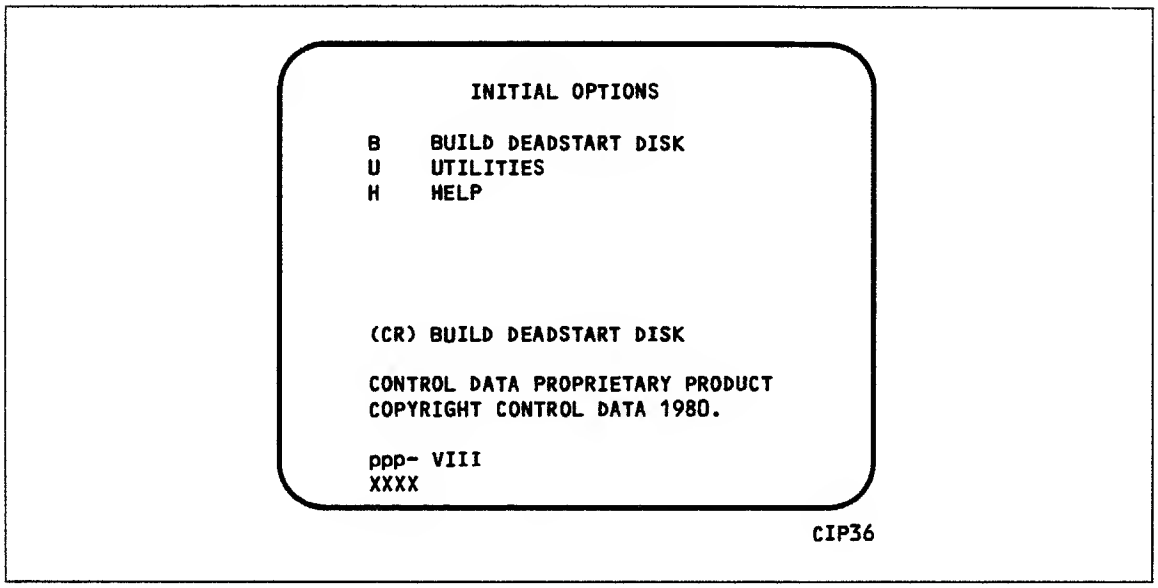


Figure 4-11. Initial Options From CIP Tape

Option	Description
(CR) or B	BUILD DEADSTART DISK. This option allows you to install the CIP to disk. CIP modules are used to initialize the mainframe and establish the operating environment. Refer to CIP Installation earlier in this section.
U	UTILITIES. Select this option to: • Perform EDD. • Perform a printer dump. • Deadstart from a different device. • Define DPB. • Display CIP component levels. • Initialize ESM after power interruption or maintenance activity. • Load/install peripheral microcode.
H	HELP for INITIAL OPTIONS display.

The CIP version number, ppp- VIII, is displayed at the bottom of the INITIAL OPTIONS display. At the very bottom of the display, xxxx is the PSR level.

Build Deadstart Disk Display

The BUILD DEADSTART DISK display, figure 4-12, appears when you select option B, BUILD DEADSTART DISK, from the INITIAL OPTIONS display. The BUILD DEADSTART DISK display is available only when you deadstart from the CIP tape. This display provides the options that install the CIP to the deadstart disk. Refer to CIP Installation earlier in this section for installation procedures and displays.

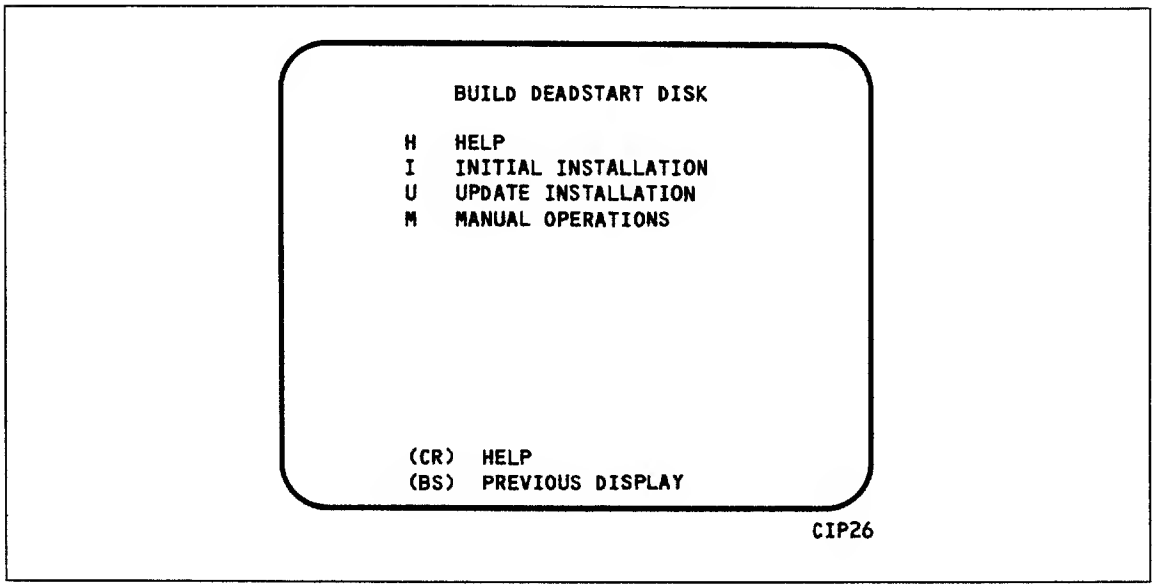


Figure 4-12. Build Deadstart Disk

Option	Description
(CR) or H	HELP for this option.
	CAUTION The INITIAL INSTALLATION option destroys all information on the deadstart disk, except for the disk microcode, before installing CIP. Before executing the INITIAL INSTALLATION option, be sure you have a backup copy of any information on the deadstart disk that you want to preserve, including operating system permanent files. After executing this option you must perform an operating system initialization of the disk.
I	INITIAL INSTALLATION. Select this option to install CIP for the first time. The INITIAL INSTALLATION option initializes the deadstart disk and then installs CIP to the deadstart disk.
U	UPDATE INSTALLATION. Select this option to replace CIP on the deadstart disk some time after the initial installation. The update option preserves operating system information on the deadstart disk.
M	MANUAL OPERATIONS. Select this option only to perform emergency CIP component replacement. The Manual Operations display, figure 4-13, provides manual operation option selection.

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Deadstart Procedure Summaries 5

Deadstart is the process that makes the system operational and ready to process jobs. If you are using a CC545 console, you initiate the deadstart process by momentarily pressing the DEADSTART button. This executes the peripheral processor (PP) deadstart program.

For I1n and all I4n class systems, in addition to support of deadstart from a CC545, CIP also supports deadstart from CC634B and CC596A display terminals which have been initialized to be the primary operator console. Refer to section 2 for steps to use the CC596A display terminal as a primary console and to appendix H for procedures to initialize a CC634B display terminal for use as a primary operator console.

When a CC634B display terminal has been initialized for use as the primary operator console, complete the following steps to bring up the DEADSTART OPTIONS display, figure 5-1, for I1n (except 815/825) and all single I4n Class systems. In the case of a dual IOU I4 Class system, the path will automatically include the display shown in figure 5-2.

When CIP is initialized, it leads directly to the MAINTENANCE OPTIONS display, figure 5-3, for the I1n Class systems.

1. Press the RESET button to reinitialize the console.
2. Hold down the CTRL key while pressing the G key.
3. When the message *OPERATOR ACCESS ENABLED* appears on the screen, hold down the CTRL key while pressing the R key.

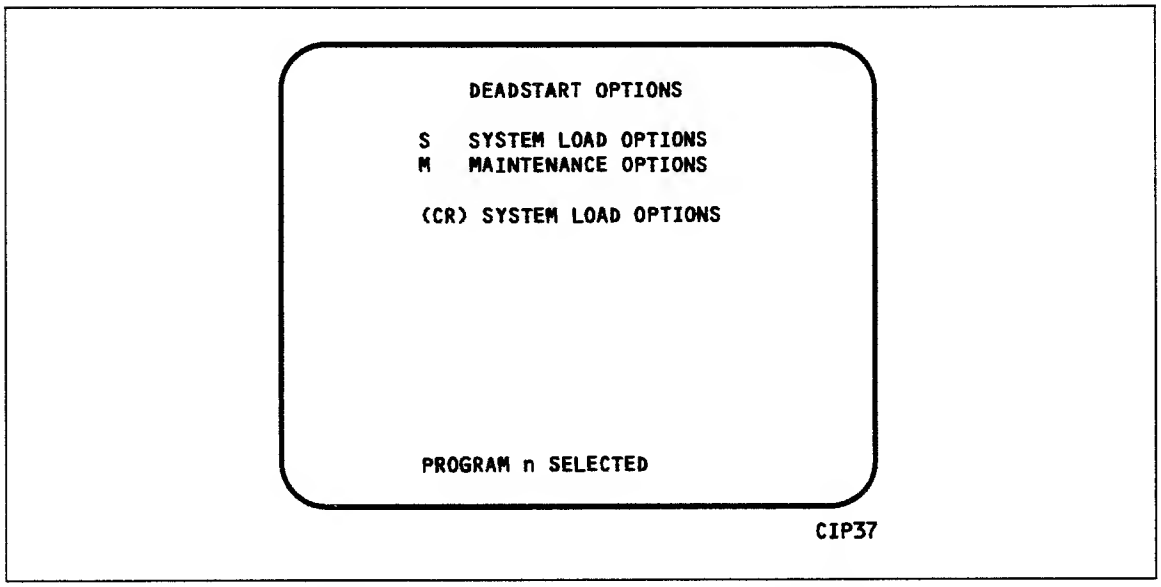


Figure 5-1. Deadstart Options for I1n (Except 815/825) and All I4n Class Systems

On I4n Class systems with a dual IOU configuration a CC596A must be used as the primary console, complete the follow steps to bring up the DEADSTART OPTIONS display.

a. Press the CTRL, ALT, and DEL keys simultaneously to reinitialize the console. The DEADSTART OPTIONS display will appear.

b. HOLD down the CTRL key while pressing the F2 key and release.

A second deadstart options display will appear, figure 5-2. This allows you to select which IOU, IOU0 or IOU1. Operating system deadstart is only supported from IOU0 and a deadstart load of CMSE is only fupported for IOU1. All procedures discussed in this manual assume you have selected IOU0.

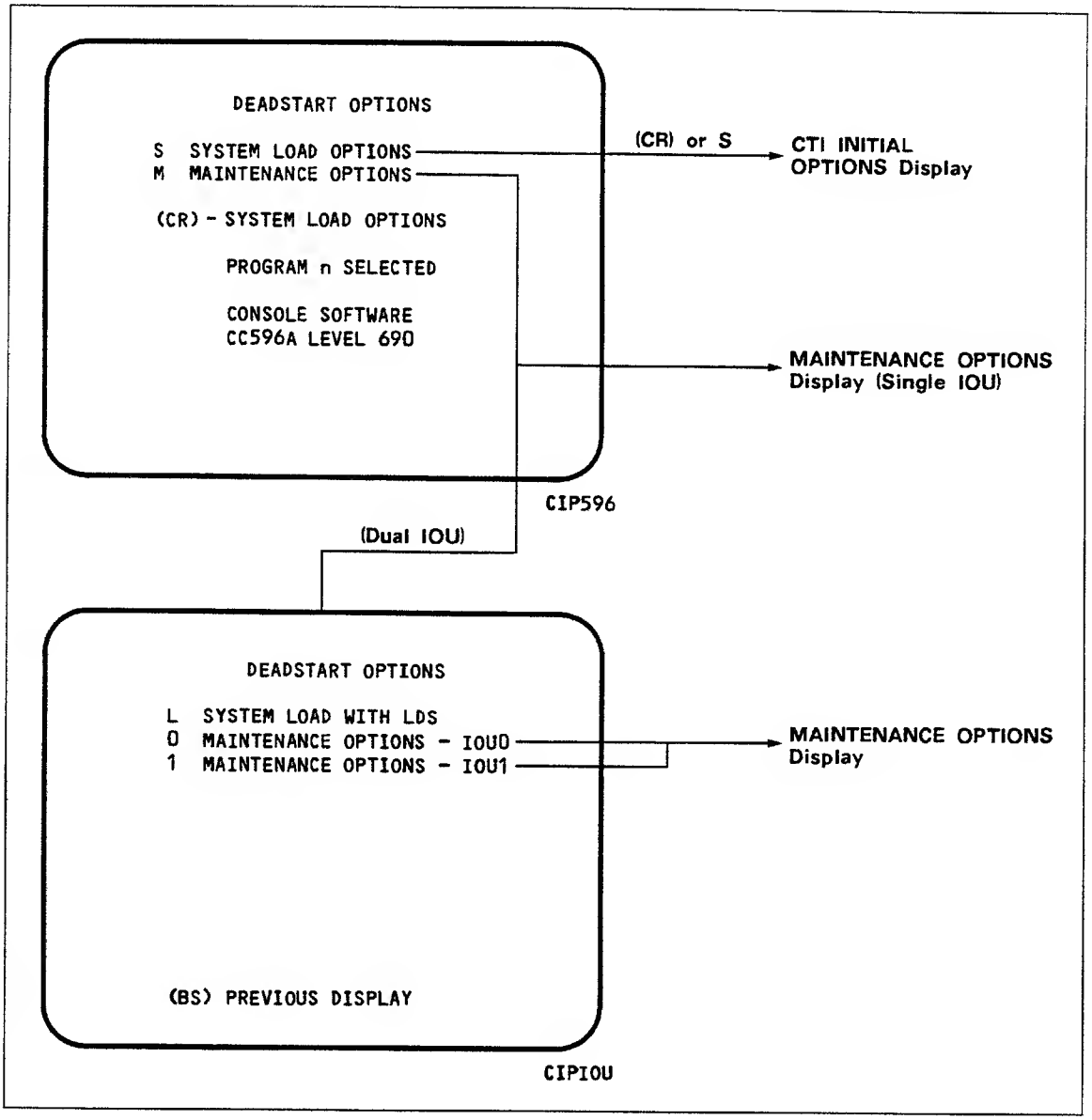


Figure 5-2. Dual IOU Deadstart Options Display

The deadstart program for I1n and all I4n Class systems can then be entered or retrieved, and initiated from the MAINTENANCE OPTIONS display. Refer to the appropriate hardware operator's guide.

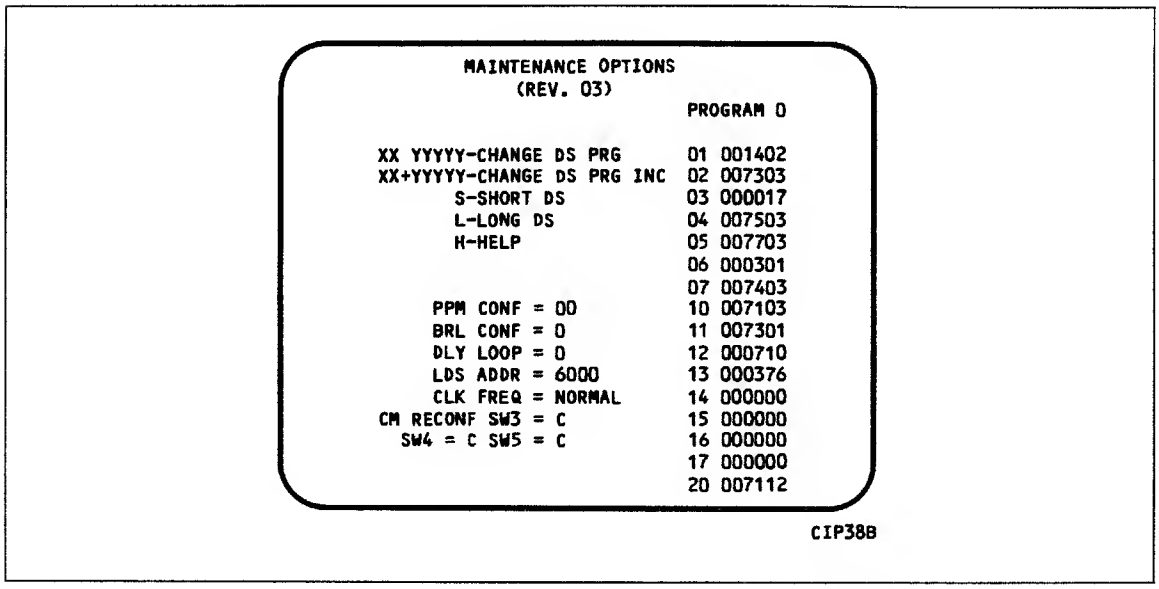


Figure 5-3. Maintenance Options for I1n Class Systems

The CC634B console is supported as the primary console for I2n Class systems with the limitation that a CTRL-G/CTRL-R deadstart cannot be performed. To select the CC634B as the primary console you must set bit 2 of deadstart panel word 12 to a one. You then initiate a deadstart by using the DEADSTART button on the CC634B, or on the CC545, the DEADSTART button or the switch on the deadstart panel.

There are two deadstart procedures: coldstart and warmstart. Coldstart is the procedure used to deadstart the system when the tape or disk controllers do not have controlware loaded. Warmstart is the procedure used when controlware is loaded and executing correctly. The CIP installation procedures and operating system deadstart procedures in sections 2 through 4 are warmstart procedures.

In general, the procedure you use most often to deadstart is warmstart. Warmstart from mass storage, or a CDC 63X/667/669/698 magnetic tape unit is possible after the disk controller or tape controller to be used is loaded with the proper controlware and the controlware is functioning. Warmstart is always possible from 677/679 magnetic tape units.

Before you perform a warmstart, the following preliminary procedures might be required.

- Coldstart.

  Loads the tape and disk controlware to their respective controllers.

- CIP installation to the disk.

  Loads appropriate CIP modules (CTI, EI, HIVS/MSL, MDD, microcode, SCI, and SCD) to the disk.

If a coldstart is required, you must do it before any other procedure. In some instances, coldstart and warmstart are combined into a single procedure (for example, coldstart/warmstart of the CDC 834 disk subsystem).

A detailed description of the coldstart procedures follows. If you do not require this information, skip to Warmstart Procedure Summary later in this section.

NOTE

Attempts to perform deadstart from mass storage could be unsuccessful in configurations with shared access to controllers and drives. Conflicts can arise in both single and multiple mainframe configurations. In a multimainframe configuration, if another mainframe reserved the controller or drive, deadstart delays momentarily until the reservation is released. In a single mainframe configuration, if another channel reserved the drive, deadstart is unsuccessful. In this case, set the deadstart program for the other channel.

Coldstart Procedures

The coldstart procedures load the tape and disk controllers with controlware. The tape controlware can be loaded from a card reader or a tape unit depending on the type of controller.

The CDC 7021 tape controller for a 667/669 magnetic tape unit requires controlware loaded from a card reader. The CDC 7152 tape controller requires controlware loaded from either a card reader or a tape unit.

The CDC 7054 and 7154 disk controllers require controlware loaded from a card reader. The controlware for a CDC 7152 disk controller and the CDC 7155 disk controller (CDC 844-41/44 and 885-11/12 disk storage units) can be loaded from either a card reader or a disk unit.

The CDC 834/836 disk subsystem controlware is loaded into the disk control module and disk adapter from the 834/836 disk or from tape.

Summaries of the procedures needed to perform a coldstart follow. These procedures apply to all mainframes except I1n and all I4n Class systems. For I1n and all I4n Class systems, refer to Coldstart Procedure Summary for I1n and All I4n Class Systems later in this section. Use the appropriate summary as a checklist during deadstart. Detailed descriptions of all procedures in the deadstart process are provided throughout the remainder of this section.

This manual assumes that power is applied on all required equipment, and that the equipment is functioning properly. If at any time the system loses power or the equipment fails, consult the site analyst or CE.

Coldstart of Tape Controllers for 667 or 669 Tape Units

Coldstart is necessary when subsequent deadstarts are from 667 or 669 magnetic tape units if the controlware has not yet been loaded to the controller. The coldstart procedure contains a special program that reads the tape controller controlware, loads it to the controller, and then loads the deadstart tape.

Use the warmstart procedure after the controlware is loaded and functioning properly. After a coldstart from a card reader, the system loads the deadstart tape automatically; use a warmstart for subsequent deadstarts only. After a coldstart from a tape unit, however, you must perform a warmstart to load the system deadstart tape.

After a successful coldstart, you should immediately reset the deadstart program for a warmstart, except for I1n and all I4n Class systems (refer to Setting the Deadstart Panel for a Warmstart later in this section).

After initial loading of the controlware, there is no reason to perform a coldstart again if the tape subsystem is operating correctly.

Coldstart 7021/7152 Tape Controller From Card Reader

The following steps summarize the procedures necessary to coldstart a 7021 or 7152 tape controller from a card reader. Use this as a checklist during coldstart. Ensure that the card reader and the tape unit on which the deadstart tape is to be mounted are on different channels. The card reader must be on a channel without a PP (for example, channel 12 or 13).

1. Ensure that required mass storage devices have packs mounted and/or are available.
2. Mount the deadstart tape.
   a. Ensure that the write-enable ring is not on the reel.
   b. Mount the tape and ready the unit.
3. Set the deadstart program[1] for a coldstart from a card reader (refer to figure 5-7 later in this section).
4. Set the mode switch to LOAD.[2]
5. Press the DEADSTART button.
6. Insert card deck[3] in the card reader and activate the card reader as follows:
   a. Press MOTOR POWER.
   b. Select AUTO MODE.
   c. Press RELOAD MEMORY.
   d. Press READY.
7. Continue with the deadstart process by selecting CIP options (refer to the INITIAL OPTIONS display for your model).

Coldstart 7152 Tape Controller From Tape Unit

The following steps summarize the procedures necessary to coldstart a 7152 tape controller from a 669 tape unit. (Coldstart of a 7152 tape controller from a 667 tape unit is not possible.) Use this as a checklist during coldstart. Ensure that the 669 tape unit is set to a unit number between 10 and 17. The unit must be on a channel without a PP (for example, channel 12 or 13).

1. Mount controlware tape on the tape unit to be specified on the deadstart panel.
   a. Ensure that the write-enable ring is not on the reel.
   b. Mount the tape and ready the unit.
2. Set the deadstart program for a coldstart from the tape unit (refer to figure 5-8 later in this section).
3. Set the mode switch to LOAD.[2]
4. Press the DEADSTART button. No display appears on the console. Unloading of the controlware tape indicates the controlware was loaded successfully.
5. Perform a warmstart to complete the deadstart operation.

---

1. Refer to Coldstart Procedure for I1n and All I4n Class Systems later in this section.
2. For all systems except I1n, I2n, and all I4n Class systems.
3. For detailed information on the controlware deck, refer to the NOS 2 or NOS/BE Installation Handbook.

Coldstart of Disk Controllers for 844, 885-11/12, or 895 Disk Units

Coldstart is necessary when deadstarting from 844, 885-11/12, or 895 disk units if the controlware is not yet loaded to the controller. The coldstart procedure contains a special program that reads the disk controller controlware, loads it to the controller, and then loads the deadstart file.

The procedure Coldstart 7054/7154/7152/7155/7165 Disk Controller From Card Reader described next loads all disk controllers. If the MSL is available at your site, the procedure Coldstart 7152/7155/7165 Disk Controller From Disk Unit, described later in this section, loads the 7152, 7155, and 7165 disk controllers.

Use the warmstart procedure after the controlware is loaded and functioning properly. After a coldstart from a card reader, the system loads the deadstart tape automatically; use a warmstart for subsequent deadstarts only.

After a successful coldstart, you should immediately reset the deadstart program for a warmstart (refer to Setting the Deadstart Panel for a Warmstart later in this section). After initial loading of the controlware, there is no reason to perform a coldstart again if the disk subsystem is operating correctly.

Coldstart 7054/7154/7152/7155/7165 Disk Controller From Card Reader

The following steps summarize the procedures necessary to coldstart a disk controller from a card reader. Use this as a checklist during coldstart. Ensure that the card reader and the disk unit on which the deadstart device is mounted are on different channels. The card reader must be on a channel without a PP (for example, 12 or 13).

1. Ensure that required mass storage devices have packs mounted and available.
2. Mount the deadstart disk unit if using an 844 disk unit.
3. Set the deadstart program[4] for a coldstart from a card reader using 844 or 885-11/12 disk units (refer to figure 5-10, later in this section).
4. Set the mode switch to LOAD.[5]
5. Press the DEADSTART button.
6. Insert card deck[6] in card reader and activate card reader as follows:
   a. Press MOTOR POWER.
   b. Select AUTO MODE.
   c. Press RELOAD MEMORY.
   d. Press READY.
7. Continue with the deadstart process by selecting CIP options (refer to the INITIAL OPTIONS display for your model of computer system).

---

4. Refer to Coldstart Procedure for I1n and All I4n Class Systems later in this section.
5. For all systems except I1n, I2n, and all I4n Class systems.
6. For detailed information on the controlware deck, refer to the NOS 2 or NOS/BE Installation Handbook.

Coldstart 7152/7155/7165 Disk Controller From Disk Unit

If controlware is loaded on a disk unit,[7] use this procedure to perform deadstart. The following steps summarize the procedures necessary to perform coldstart from a disk unit. Use this as a checklist during coldstart.

1. Ensure that required mass storage devices have packs mounted and/or are available.
2. Mount the deadstart disk unit if using an 844 disk unit.
3. Set the deadstart program[8] for coldstart from a disk unit (figure 5-10). Set the mode switch to LOAD.[9]
4. Press the DEADSTART button. The INITIAL OPTIONS display appears.
5. Continue with the deadstart process by selecting CIP options (refer to the INITIAL OPTIONS display for your model of computer system).

Coldstart Procedure Summary for I1n and All I4n Class Systems

The procedures to coldstart various controllers for I1n and any I4n Class system are similar to those for other computer systems except that these do not have a deadstart panel. The coldstart programs represented by the deadstart panel switch settings on I2n Class systems must be entered through the console keyboard on I1n and all I4n Class systems as octal numbers. Coldstart programs for I1n and all I4n Class systems are identical to those for I2n Class systems except where specifically noted.

In the various coldstart procedures described in this section, deadstarting an I1n model (except 815/825) or any single IOU I4n Class system model brings up the DEADSTART OPTIONS display shown in figure 5-1. Selecting option M on this display brings up the MAINTENANCE OPTIONS display shown in figure 5-3. Selecting option S or pressing the carriage return key brings up the INITIAL OPTIONS display (refer to section 2). Deadstarting on an I1n Class system (models 815/825 only) brings up the MAINTENANCE OPTIONS display shown in figure 5-3.

The bottom line of the DEADSTART OPTIONS display (I1n [except 815/825] or any I4n Class system) identifies which deadstart program is selected and is to be executed. If this is not the desired deadstart program, enter M to bring up the MAINTENANCE OPTIONS display. I4n Class systems having a dual IOU configuration will have an extra DEADSTART OPTIONS display shown in figure 5-2. This allows you to select IOU0 or IOU1. O.S. deadstart is supported for IOU0 only. If you select IOU1 you will get the IOU1 two port mux display. You can only do a deadstart load of CMSE from IOU1.

The following paragraphs describe how to retrieve or modify the deadstart program for I1n or any I4n Class system using the MAINTENANCE OPTIONS display.

---

7. For more information on loading controlware to the disk, contact a CE.
8. For I1n and all I4n Class systems refer to Coldstart Procedure for I1n and All I4n Class Systems, next.
9. For all systems except I1n, I2n, and all I4n 990 Class systems.

If the coldstart program is already stored in the microprocessor, retrieve it by entering:

```
GP n
```

n (0 through 3) is the number of the stored program. You can change individual instructions in a program, such as unit number or other parameters, as described next. These changes are not retained across deadstarts unless the new program is stored as outlined later in this section.

If the correct coldstart program is not stored or a new program is to be entered and stored, the program must be entered as octal numbers equivalent to the switch settings on deadstart panels for other models.

Enter the coldstart program represented by the switch settings shown in the related deadstart panel figure for your configuration by entering:

```
xx yyyyyy (or xx.yyyyyy, or xx,yyyyyy)
```

xx is the octal row number of the deadstart instruction and yyyyyy is the octal number equivalent of the actual instruction. When you enter a six-digit instruction, the first two digits of the instruction must be zeros. Leading zeros in both the octal row number and the instruction, however, need not be entered. For example, if the row number was 03 and the instruction was 001014, you could enter:

```
3 1014
```

and get the same setting as entering:

```
03 001014.
```

If you want the system to automatically increment the octal row number, the entry after which the increment is to occur is:

```
xx+yyyyyy
```

The + character indicates that the system is to automatically increment the octal row number. When the automatic increment is in effect, the system displays the next location after accepting the previous entry. Only the next instruction need be entered.

To cancel the automatic incrementing, press the left blank (erase) key after the octal row number appears.

To store a new program or a modified program, enter:

```
SP n
```

n (0 through 3) is the number of the program to be stored. If a program is already stored at the specified number, the new program replaces it.

After entering or retrieving the desired coldstart program, enter

```
S
```

then press the carriage return key to coldstart the controller.

Coldstart/Install 834/836 Disk Subsystem Microcode From CIP Tape

A special utility provides the capability of loading disk subsystem microcode into the 834 or 836 disk adapter and control module memory (coldstart) and of installing microcode onto the specified disk drives. Refer to Loading and Installing Disk Subsystem Microcode From CIP Tape in section 9 for information about this utility. When microcode has been installed onto the disk, the Coldstart/Warmstart 834/836 Disk Subsystem From Disk procedure described next can be used.

Coldstart/Warmstart 834/836 Disk Subsystem From Disk

Use the following procedure to coldstart and warmstart an 834 or 836 disk subsystem. A coldstart loads controlware, which has been installed onto the disk, into the disk adapter and control module. Once the disk has been coldstarted, the warmstart occurs automatically.

1. Press the DEADSTART button on the CC545 display console to bring up the MAINTENANCE OPTIONS display shown in figure 5-3.

   When a CC634B display terminal is being used as the primary operator console, complete the following steps to bring up the MAINTENANCE OPTIONS display.

   a. Press the RESET button to reinitialize the console.

   b. Hold down the CTRL key while pressing the G key.

   c. When the message `*OPERATOR ACCESS ENABLED*` appears on the screen, hold down the CTRL key while pressing the R key.

   If a CC596A is being used as the primary console, complete the follow steps to bring up the DEADSTART OPTIONS display.

   a. Press the CTRL, ALT, and DEL keys simultaneously to reinitialize the console. The DEADSTART OPTIONS display will appear.

   b. HOLD down the CTRL key while pressing the F2 key and release.

2. For I1n and all I4n Class systems, the first display you see is the DEADSTART OPTIONS display shown in figure 5-1.

   If the program selected is the desired coldstart program, enter an L.

   If the program selected is not the desired warmstart program, enter an M to bring up the MAINTENANCE OPTIONS display shown in figure 5-3 and complete the following steps.

   If the coldstart/warmstart program is already stored in microprocessor random access memory (RAM):

   a. Retrieve the coldstart program by entering GP n and then pressing the carriage return key. n (0 through 3 octal) is the RAM program number.

   b. Skip steps 3 and 4.

3. Enter the coldstart/warmstart program (refer to figure 5-11 later in this section) using the console keyboard.

4. Enter SP n if you want to store your program in RAM for future use. n (0 through 3 octal) is the RAM program number.

5. Coldstart the disk controller by entering either S or L then pressing the carriage return key. The INITIAL OPTIONS display appears.

Coldstart 639 Tape Unit From Tape

Use the following procedure to coldstart a 639 intelligent small tape unit (ISMT) on I1n and I4n class systems. This procedure is to be used when mainframe power has been turned off and the subsequent deadstart is to be from a tape unit. A coldstart loads peripheral microcode (controlware) from the CIP tape into the tape unit adapter. Once the tape unit has been coldstarted, the warmstart procedure, described previously, should be followed.

1. Apply power to the system and 639 tape unit.
2. Mount the CIP tape on the tape unit.
3. Ensure that the tape unit is placed on line.
4. If the system console is a CC634B display terminal, press the RESET button to reinitialize the system console. If the CC634B console has never been initialized, complete the steps given in appendix H to initialize the console.
5. Complete the following steps to bring up the DEADSTART OPTIONS display shown in figure 5-1. When using a CC634B console:
   a. Hold down the CTRL key while pressing the G key.
   b. When the message *OPERATOR ACCESS ENABLED* appears on the screen, hold down the CTRL key while pressing the R key.

   Press the DEADSTART button on the console when using a CC545 console.

   If a CC596A is being used as the primary console, complete the follow steps to bring up the DEADSTART OPTIONS display.
   a. Press the CTRL, ALT, and DEL keys simultaneously to reinitialize the console. The DEADSTART OPTIONS display will appear.
   b. HOLD down the CTRL key while pressing the F2 key and release.
6. Enter M to bring up the MAINTENANCE OPTIONS display shown in figure 5-3.
7. If the coldstart program is already stored in microprocessor RAM:
   a. Retrieve the coldstart program by entering GP n then pressing the carriage return key. n (0 through 2 octal) is the RAM program number.
   b. Skip steps 8 and 9.
8. Enter the coldstart program shown in figure 5-15 or figure 5-16, later in this section, using the console keyboard.

   Program entry is done by entering xx yyyyyy then pressing the carriage return key. xx (1 through 20 octal) is the location and yyyyyy (octal) is the instruction. The first two digits of the instruction should be zeros; however, leading zeros, both in the location and in the instruction, do not have to be entered. If you want the system to add an increment to the location automatically, enter xx+yyyyyy. When the automatic increment is in effect, the system displays the next location after accepting the previous entry. Then enter only the instruction. To terminate the automatic increment, press the erase key after the location appears.

9. Enter SP n if you want to store your program in RAM for future use. n (0 through 3 octal) is the RAM program number.

10. Coldstart as follows when using a CC634B console.

    a. Hold down the CTRL key while pressing the G key.

    b. Hold down the CTRL key while pressing the R key.

    Press the DEADSTART button on the console when using a CC545 console.

    c. Enter S to coldstart the tape unit. Upon receipt of the 60u function, the tape unit adapter:

        1) Executes internal diagnostics.

        2) Connects to the 639 ISMT.

        3) Rewinds the tape unit.

        4) Reads the 639 microcode record from tape.

        5) Verifies the microcode ID and revision level.

        6) Performs a checksum of the microcode.

        7) Executes the microcode diagnostics.

        8) Rewinds the tape if all of the preceding items execute properly.

    You will see the message SYSTEM INITIALIZATION IN PROGRESS.

To verify proper loading of the microcode or to identify the cause of a bad load, complete the following steps.

1. Wait for tape motion to stop or wait about 10 seconds if the tape did not move; then bring up the DEADSTART OPTIONS display shown in figure 5-1. When using a CC634B console:

    a. Hold down the CTRL key while pressing the G key.

    b. Hold down the CTRL key while pressing the R key.

    Press the DEADSTART button on the console when using a CC545 console.

    If a CC596A is being used as the primary console, complete the follow steps to bring up the DEADSTART OPTIONS display.

    a. Press the CTRL, ALT, and DEL keys simultaneously to reinitialize the console. The DEADSTART OPTIONS display will appear.

    b. HOLD down the CTRL key while pressing the F2 key and release.

2. Enter M to bring up the MAINTENANCE OPTIONS display shown in figure 5-3.

3. Enter PR then press the carriage return key to bring up the PP REGISTER display.

4. Examine the PP 00 line of the display. If P equals 0016, enter PM then press the carriage return key to bring up the PP MEMORY display. If location 0030 equals 1000, the microcode is loaded and initialized correctly and the tape unit is ready to use.

   NOTE

   This display shows the contents of PP registers for barrel 0. Press the + key to display the PP registers for barrel 1 if you have reconfigured PPs using the RB command.

5. If P does not equal 0016 on the PP REGISTER display, or location 0030 does not equal 1000 on the PP MEMORY display, an error has occurred. Recheck the entries in the deadstart program and the status of the hardware to ensure you did not make an error when following the procedure. Retry the procedure, and if you are still unsuccessful, call a CE for help.

Coldstart 698 Tape Unit From Tape

Use the following procedure to coldstart a 698 CYBER Magnetic Tape Unit (CMTS) on a model I1n and all I4n Class Systems. This procedure is to be used when mainframe power has been turned off and the subsequent deadstart is to be from a tape unit. A coldstart loads peripheral microcode (controlware) from the CIP tape into the CYBER Channel Coupler (CCC). Once the tape unit has been coldstarted, the warmstart procedure, described previously, should be followed.

1. Apply power to the system and 698 tape unit.
2. Mount the CIP tape on the tape unit.
3. Ensure that the tape unit is placed on line.
4. If the system console is a CC634B display terminal, press the RESET button to reinitialize the system console. If the CC634B console has never been initialized, complete the steps given in appendix H to initialize the console.
5. Complete the following steps to bring up the DEADSTART OPTIONS display shown in display 5-1. When using a CC634B console:

   a. Hold down the CTRL key while pressing the G key.

   b. When the message OPERATOR ACCESS ENABLED appears on the screen, hold down the CTRL key while pressing the R key.

   Press the DEADSTART button on the console when using a CC545 console.

   If a CC596A is being used as the primary console, complete the follow steps to bring up the DEADSTART OPTIONS display.

   a. Press the CTRL, ALT, and DEL keys simultaneously to reinitialize the console. The DEADSTART OPTIONS display will appear.

   b. HOLD down the CTRL key while pressing the F2 key and release.

6. Enter M to bring up the MAINTENANCE OPTIONS display shown in display 5-3.

7. If the coldstart program is already stored in microprocessor RAM:

   a. Retrieve the coldstart program by entering GP n then pressing the carriage return key. n (0 through 2 octal) is the RAM program number.

   b. Skip steps 8 and 9.

8. Enter the coldstart program shown in figure 5-17 or figure 5-18 using the console keyboard.

   Program entry is done by entering xx yyyyyy then pressing the carriage return key. xx (1 through 20 octal) is the location and yyyyyy (octal) is the instruction. The first two digits of the instruction should be zeros; however, leading zeros, both in the location and in the instruction, do not have to be entered. If you want the system to add an increment to the location automatically, enter xx+yyyyyy. When the automatic increment is in effect, the system displays the next location after accepting the previous entry. Then enter only the instruction. To terminate the automatic increment, press the erase key after the location appears.

9. Enter SP n if you want to store your program in RAM for future use. n (0 through 2 octal) is the RAM program number.

10. Coldstart as follows when using a CC634B console:

    a. Hold down the CTRL key while pressing the G key.

    b. Hold down the CTRL key while pressing the R key.

       Press the Deadstart button on the console when using a CC545 console.

    c. Enter S to coldstart the tape unit. Upon receipt of the 60u function, the tape unit adapter:

       - Executes internal diagnostics.
       - Connects to the 698 CMTS.
       - Rewinds the tape unit.
       - Reads the 698 microcode record from tape.
       - Verifies the microcode ID and revision level.
       - Performs a checksum of the microcode.
       - Executes the microcode diagnostics.
       - Rewinds the tape if all of the preceding items execute properly.

    You will see the message `SYSTEM INITIALIZATION IN PROGRESS.`

NOTE

If the tape does not move or it fails to rewind after moving forward, refer to the 698 CYBER Magnetic Tape Subsystem (CMTS) users Guide, publication number 60000009, section 5, Troubleshooting.

Setting the Deadstart Panel for a Coldstart

The deadstart panel (for all models of the CYBER 170 computer system except I1n, I2n, and all I4n Class systems) contains a 16-by-12 matrix of toggle switches (see figure 5-4). The matrix rows are numbered from 1 to 20_8. The CYBER 70 and 6000 computer systems deadstart panel (see figure 5-5) contains a 12-by-12 matrix with rows numbered from 0001 to 0014_8.

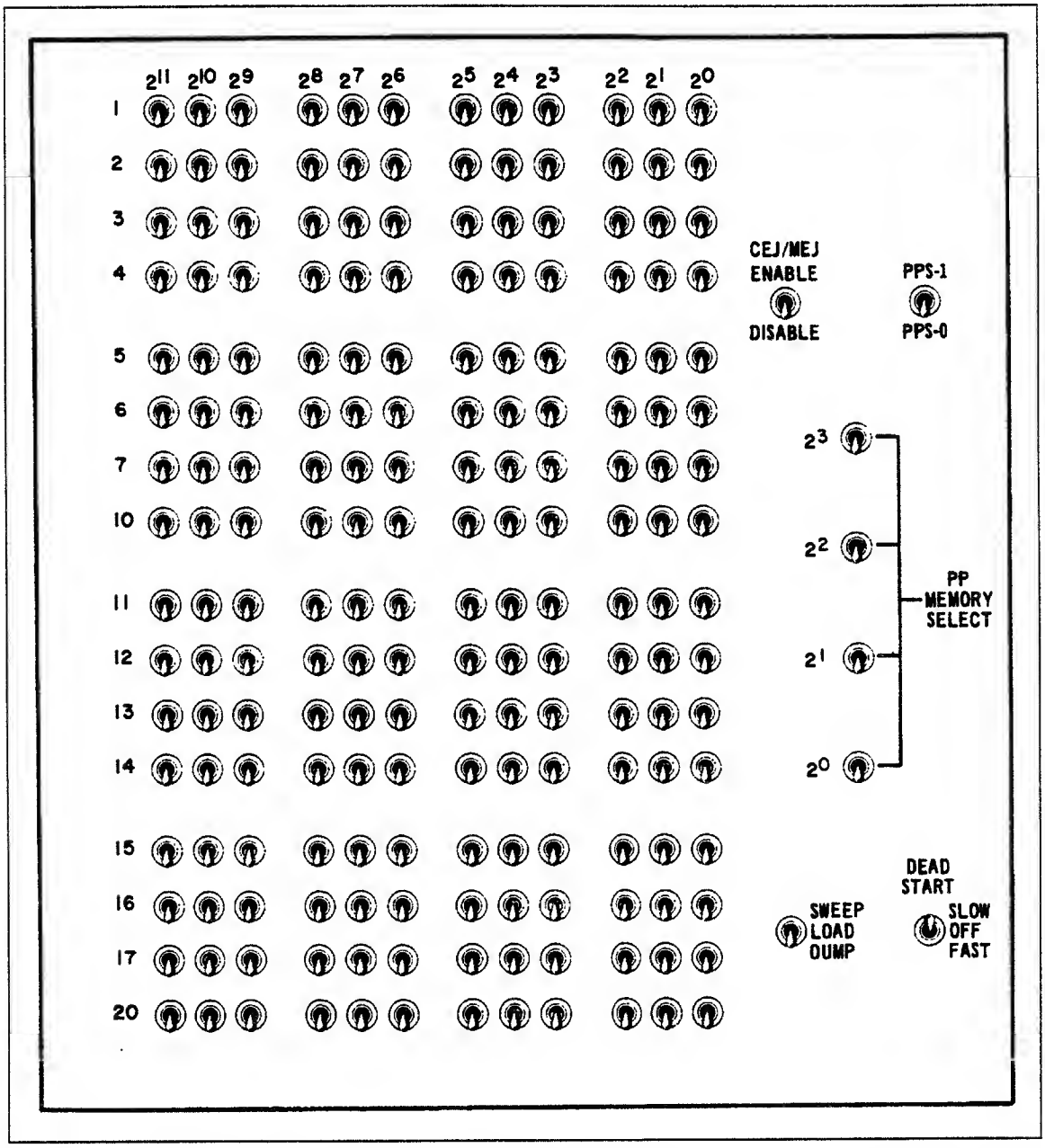


Figure 5-4. CYBER 170 Computer Systems (Except I1n, I2n, and All I4n Class Systems) Deadstart Panel

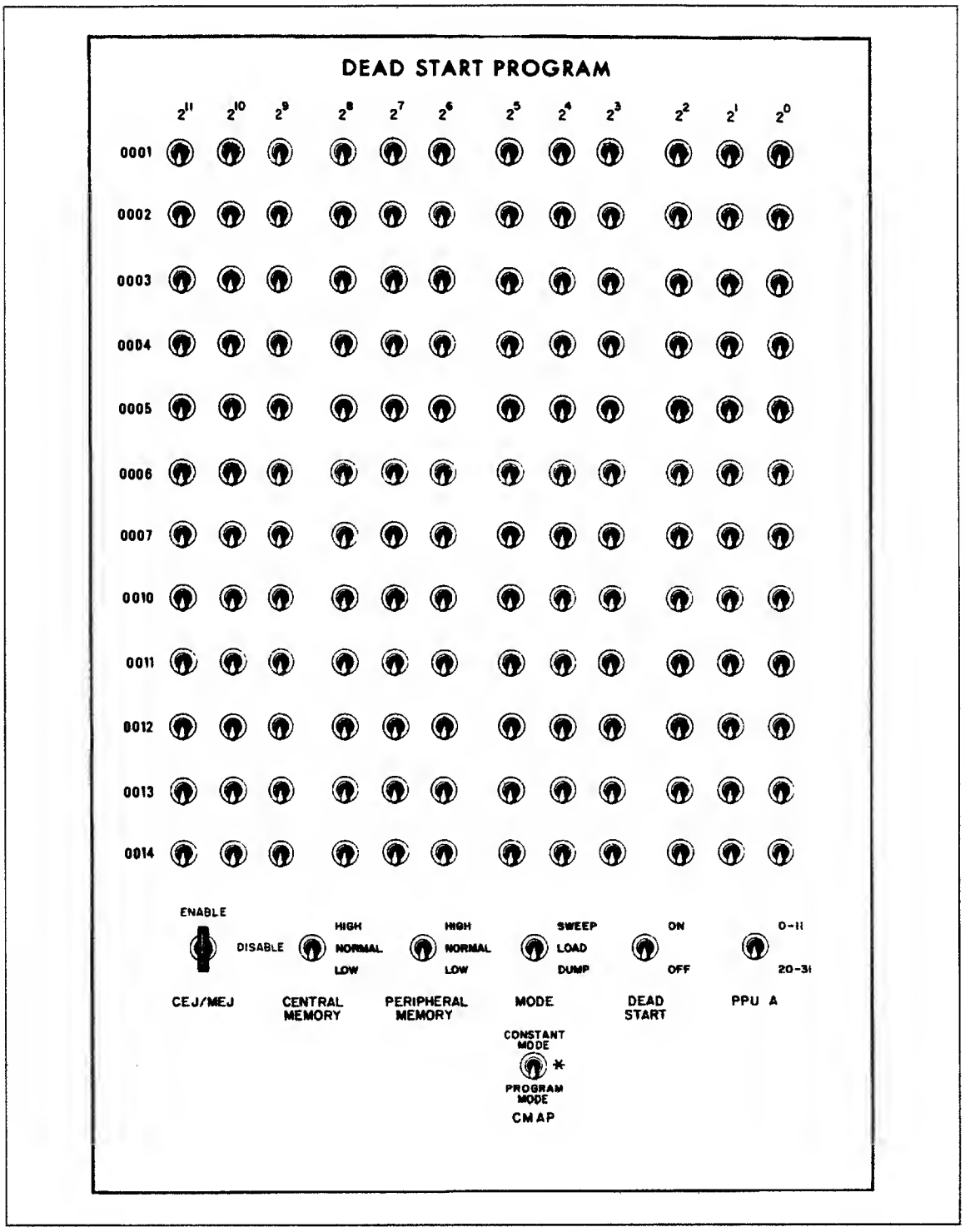


Figure 5-5. CYBER 70/6000 Computer Systems Deadstart Panel

Each row of switches represents a 12-bit PP instruction word in the deadstart program. Thus, by setting these switches in a prescribed manner, you create the program necessary to deadstart; this deadstart program is subsequently loaded into PP0 memory. It is executed whenever you press the DEADSTART button.

The deadstart program:

- Identifies the tape/disk unit, controller, and channel number to be used to access the deadstart device (specified in words 1 through 10).
- Reads the first record from the deadstart file. This routine initiates the processing of the remainder of the deadstart file according to the options specified in the deadstart program (word 13).

The deadstart panel for I2n Class systems (see figure 5-6) contains a 16-by-16 matrix of toggle switches with rows numbered from 1 to 20_8. To deadstart model 835, set the four leftmost columns of switches (columns 2^{12} through 2^{15}) to the down position.

NOTE

All switches in columns 2^{12} through 2^{15} must be in the down position for proper operation of I2n Class systems.

Use the 12 rightmost columns to set the 12-bit PP instruction words that are the deadstart program; this program is subsequently loaded into PP0 memory. It is executed whenever you press the DEADSTART button.

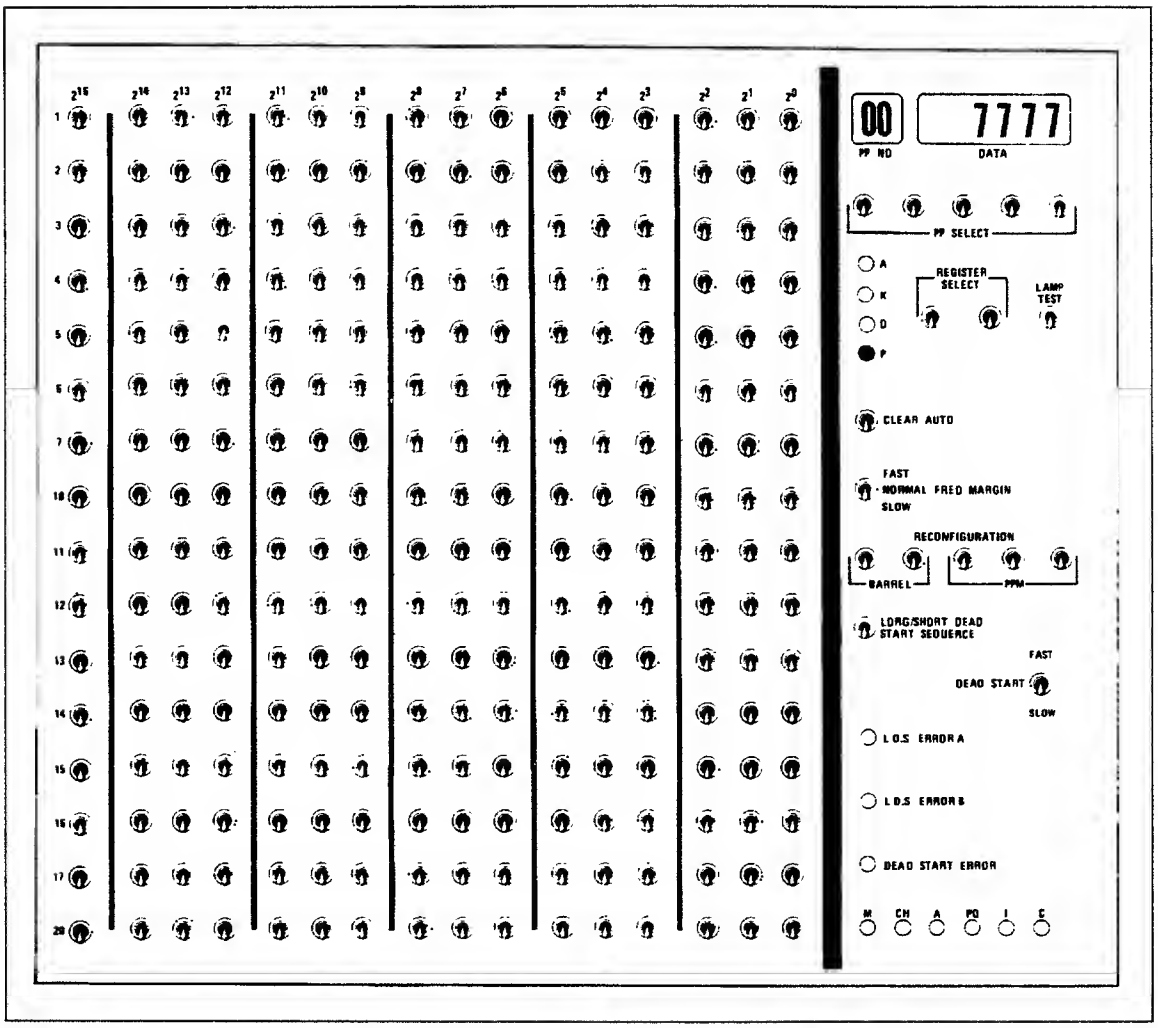


Figure 5-6. I2n Class Systems Deadstart Panel

For I2n Class systems select one of these deadstart options.

Option	Action
No testing	Set the LONG/SHORT DEADSTART SEQUENCE switch to the down (short) position.
Confidence testing	Set the LONG/SHORT DEADSTART SEQUENCE switch to the up (long) position. This option destroys some information in PP memory (refer to Performing an Express Deadstart Dump in section 6).
Extended deadstart testing	Set the LONG/SHORT DEADSTART SEQUENCE switch to the up (long) position and set the rightmost bit (2^0) of word 12 to the up position. This option destroys some information in PP memory (refer to Performing an Express Deadstart Dump in section 6).

For normal operator deadstarts, performing the confidence test and extended deadstart test is not necessary. These tests are usually done after maintenance is performed on the system. Refer to the appropriate hardware reference manual for more information on extended deadstart testing.

In the illustrations of the deadstart panel words that accompany the following descriptions, switch position 1 (switch in up position) and switch position 0 (switch in down position) are mandatory settings. The switch positions for fields represented by alphabetic characters, however, are determined by each installation. Octal values entered on the I1n, I2n, and all I4n Class systems deadstart displays appear to the right of the panel illustrations.

NOTE

Before pressing the DEADSTART button, set the mode switch on the deadstart panel to LOAD (for all systems except I1n, I2n, and all I4n Class systems) and set the CMAP switch to CONSTANT MODE (for the CYBER 70 and 6000 computer systems).

For all computer systems except I1n, I2n, and all I4n Class systems, the CEJ/MEJ option is logically enabled by default. NOS does not run if the CEJ/MEJ option is disabled. For I1n, I2n, and all I4n Class systems, CEJ/MEJ is permanently enabled. You cannot turn it off.

For all computer systems except I1n, I2n, and all I4n Class systems, if there is no CEJ/MEJ switch or key or if it is physically set to the disable position on the deadstart panel and you do not logically override it via the HARDWARE RECONFIGURATION display (refer to the OPERATOR INTERVENTION display for your model of computer system), the system displays the following error message after you press the final carriage return for the the CTI options.

```
CEJ/MEJ OPTION NOT ENABLED
FOR CEJ/MEJ USAGE, ENABLE SWITCH
ON DEADSTART PANEL AND DEADSTART

(CR) FOR NON CEJ/MEJ USAGE
```

To choose the CEJ/MEJ option, enable the switch or key on the deadstart panel and deadstart again.

The preceding display also appears if the CEJ/MEJ switch or key fails, and you have not logically disabled it.

NOTE

For CYBER 70 and 6000 computer systems, turn the CEJ/MEJ key fully counterclockwise to enable CEJ/MEJ. Turn the key fully clockwise to disable CEJ/MEJ.

Descriptions of the panel settings for coldstart of tape and disk controllers and for the panel settings for word 13 of the deadstart panel follow.

Panel Settings for Coldstart of 7021/7152 Tape Controller From Card Reader

During coldstart from a card reader, the deadstart program:

- Identifies the controller and channel number used to access the card reader from which the controlware is to be read.
- Specifies the controller, channel, and unit number of the tape unit on which the deadstart tape is mounted.
- Reads the controlware card deck (this deck loads the tape controller).
- Processes the deadstart tape according to the options specified on the deadstart panel.

You identify the equipment necessary for the devices used during coldstart by setting the switches shown in the unshaded area of the deadstart panel (see figure 5-7). This includes both the channel and controller number associated with the card reader and the channel, controller, and unit number of the tape unit.

	Binary				Octal
1	111	101	1cc	ccc	75cc
2	111	111	0cc	ccc	77cc
3	fff	000	000	000	f000
4	000	000	000	000	0000
5	111	111	0cc	ccc	77cc
6	001	100	000	000	1400
7	111	100	0cc	ccc	74cc
10	111	001	0cc	ccc	71cc
11	111	110	110	100	7664
12	000	000	0cc	ccc	00cc†
13	rrr	ppp	xxx	xxx	rpxx††
14	eee	010	11u	uuu	e2uu

†Refer to Setting Word 12 later in this section for information on performing deadstart testing for models 835, 845, and 855.
††The instructions for setting the bits represented by these parameters are given under Setting Word 13 later in this section.

Figure 5-7. Coldstart of 7021/7152 Tape Controller From Card Reader

Descriptions of the deadstart panel parameters follow.

Parameter	Description
cc ccc	Channel number used to access the card reader from which the controlware is to be read.
fff	Controller number to which the card reader is connected.
tt ttt	Channel number used to access the deadstart tape equipment.
rrr	Deadstart level.
ppp	Deadstart parameters.
xxx xxx	CMRDECK number (NOS), CMR number (NOS/BE).
eee	Controller number to which the tape unit is connected.
u uuu	Physical unit number of the tape unit on which the deadstart tape is mounted.

The card reader and the tape unit on which the deadstart tape is mounted must be on different channels. The card reader must be on a channel without a PP (for example, channel 12 or 13). Refer to appendix F to determine which channels in your hardware configuration do not have PPs.

The numbers are entered in binary form; each switch represents a bit in a 12-bit PP instruction word.

Refer to Setting Word 13 later in this section for detailed information on word 13 parameters. For models I2n Class systems, set the four leftmost bit positions for each row to 0 (they are not shown in figure 5-7).

After a successful coldstart, you should immediately reset the deadstart panel for a warmstart.

If the tape subsystem is functioning properly, there is no need to perform another coldstart after initially loading the controlware.

Panel Settings for Coldstart of 7152 Tape Controller From Tape Unit

During coldstart from a tape unit, the deadstart program:

- Identifies the channel and unit number of the tape unit on which the controlware tape is mounted and to be read.
- Reads the controlware tape, which loads the tape controller.

You identify the tape unit and the channel used to access the unit by setting the switches shown in the unshaded area of the deadstart panel (see figure 5-8). The tape unit number must be between 10 and 17, and the unit must be on a channel without a PP (for example, channel 12 or 13). Refer to appendix F to determine which channels in your hardware configuration do not have PPs.

The numbers are entered in binary form; each switch represents a bit in a 12-bit PP instruction word. The remainder of the panel is not used. For I1n, I2n, and all I4n Class systems, set the four leftmost bit positions for each row to 0 (they are not shown in figure 5-8).

Unloading of the controlware tape indicates that the controlware was loaded successfully. It is necessary to reset the deadstart panel for a warmstart immediately in order to proceed with loading the system deadstart tape.

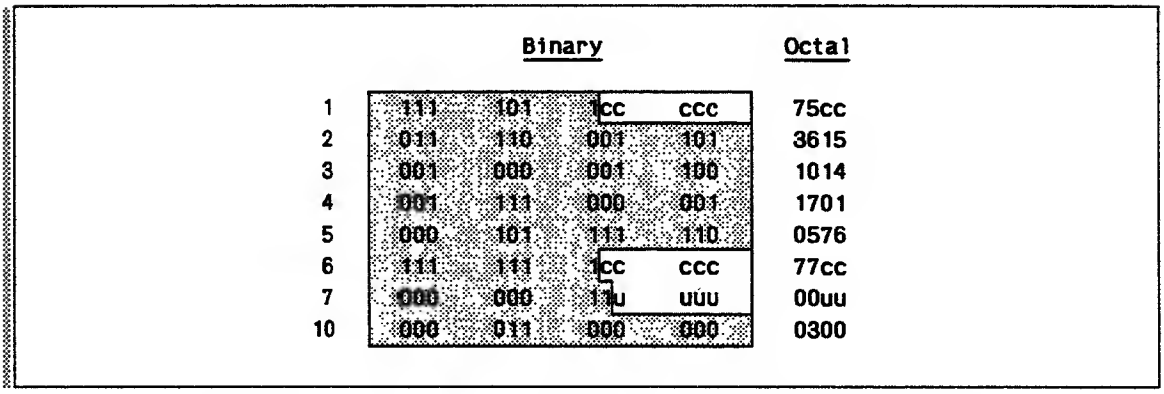


Figure 5-8. Coldstart of 7152 Tape Controller From Tape Unit

Descriptions of the deadstart panel parameters follow.

Parameter	Description
tt ttt	Channel number that accesses the controlware tape equipment.
u uuu	Physical unit number of the tape unit on which the controlware is mounted.

Panel Settings for Coldstart of 7054/7154/7152/7155/7165 Disk Controller From Card Reader

During coldstart from a card reader, the deadstart program:

- Identifies the controller and channel number that accesses the card reader from which the controlware is to be read.
- Specifies the controller, channel, and unit number of the drive on which the deadstart disk is mounted.
- Reads the controlware card deck (this deck loads the disk controller).
- Processes the deadstart tape according to the options specified on the deadstart panel.

You identify the equipment necessary for the devices used during coldstart by setting the switches shown in the unshaded area of the deadstart panel (see figure 5-9). This includes the channel number and controller associated with the card reader and the channel, controller, and unit number of the disk unit.

The card reader and the drive on which the deadstart disk is mounted must be on different channels. The card reader must be on a channel without a PP (for example, channel 12 or 13). Refer to appendix F to determine which channels in your hardware configuration do not have PPs.

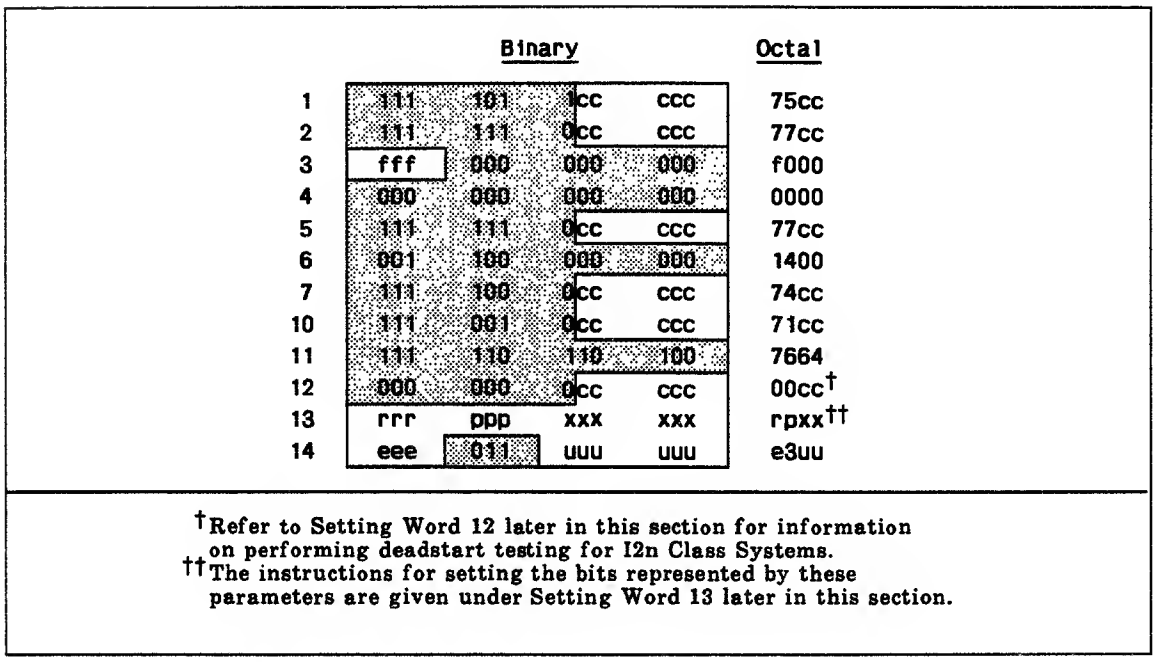


Figure 5-9. Coldstart of Disk Controller From Card Reader

Descriptions of deadstart panel parameters follow.

Parameter	Description
cc ccc	Channel number used to access the card reader from which the controlware is to be read.
fff	Controller number to which the card reader is connected (4, 5, 6, or 7).
tt ttt	Channel number used to access the deadstart disk equipment.
rrr	Deadstart level.
ppp	Deadstart parameters.
xxx xxx	CMRDECK number (NOS), CMR number (NOS/BE).
eee	Controller number to which the disk unit is connected.
uuu uuu	Physical unit number of the drive on which the deadstart disk is mounted.

NOTE

When deadstarting from a 7054 or 7154 disk controller, incorrect panel settings, such as channel or unit numbers, can hang the controller. To free the controller, correct the panel settings and master clear the controller by pressing the STOP, MASTER CLEAR, and GO buttons, in that order. These buttons are located inside the controller chassis.

The numbers are entered in binary form; each switch represents a bit in a 12-bit PP instruction word. For models 835 through 860, set the four leftmost bit positions for each row to 0 (they are not shown in figure 5-9).

Refer to Setting Word 13 later in this section for detailed information on word 13 parameters.

After coldstart, it is advised that you immediately reset the deadstart panel for a warmstart.

If the disk subsystem is functioning properly, there is no need to perform another coldstart after initial loading of the controlware.

Panel Settings for Coldstart of 7152/7155/7165 Disk Controller From Disk Unit

During coldstart from a disk unit, the deadstart program:

- Identifies the controller and channel number used to access the disk unit from which the controlware is to be read.
- Specifies the controller, channel, and unit number of the drive on which the deadstart disk is mounted.
- Reads the controlware (this controlware loads the disk controller).
- Processes the deadstart file according to the options specified on the deadstart panel.

The equipment necessary for the devices used during coldstart is identified by setting the switches shown in the unshaded area of the deadstart panel (see figures 5-10 through 5-12 for appropriate configurations). This includes the channel number and controller associated with the disk unit and the channel, controller, and unit number of the drive.

	Binary				Octal
1	000	000	000	000	0000
2	111	101	ttt	ttt	75cc
3	111	111	0tt	ttt	77cc
4	eee	001	vvv	vvv	e1vv
5	111	111	0tt	ttt	77cc
6	eee	011	uuu	uuu	e3uu
7	111	100	0tt	ttt	74cc
10	111	001	0tt	ttt	71cc
11	111	011	000	001	7301
12	000	000	000	000	0000
13	rrr	ppp	xxx	xxx	rpxx†
14	000	000	000	000	0000

†The instructions for setting the bits represented by these parameters are given under Setting Word 13 later in this section.

Figure 5-10. Coldstart of 7152/7155/7165 Disk Controller From Disk Unit (CYBER 70/6000 Systems)

	Binary				Octal
1	000	000	000	000	0000
2	000	000	000	000	0000
3	000	000	000	000	0000
4	111	101	ccc	ccc	75cc
5	111	111	ccc	ccc	77cc
6†	000	001	uuu	uuu	01uu
7	111	100	ccc	ccc	74cc
10	111	001	ccc	ccc	71cc
11	111	011	000	001	7301
12	000	000	000	000	0000
13	rrr	ppp	xxx	xxx	rpxx
14	000	000	000	000	0000
15	000	000	000	000	0000
16	000	000	000	000	0000
17	000	000	000	000	0000
20	000	000	000	000	0000

†For 7165 controllers/895 diskdrives, set word 6 as follows:

6	000	001	sss	ddd	01sd

where sss = storage director number
ddd = disk drive number

Figure 5-11. Coldstart of 7152/7155/7165 Disk Controller From Disk Unit, With No PP on Disk Channel (I1n, I2n, and All I4n Class Systems)

	Binary				Octal
1	001	100	000	010	1402
2	111	011	0cc	ccc	73cc
3	000	000	001	111	0017
4	111	101	1cc	ccc	75cc
5	111	111	0cc	ccc	77cc
6†	000	001	uuu	uuu	01uu
7	111	100	0cc	ccc	74cc
10	111	001	0cc	ccc	71cc
11	111	011	000	001	7301
12	000	000	000	000	0000
13	rrr	ppp	xxx	xxx	rpxx
14	000	000	000	000	0000
15	000	000	000	000	0000
16	000	000	000	000	0000
17	000	000	000	000	0000
20	111	001	001	010	7112

†For 7165 controllers/895 diskdrives, set word 6 as follows:

6	000	001	sss	ddd	01sd

where sss = storage director number
ddd = disk drive number

Figure 5-12. Coldstart of 7152/7155/7165 Disk Controller From Disk Unit, With PP on Disk Channel (I1n, I2n, and All I4n Class Systems)

Descriptions of the deadstart panel parameters follow.

Parameter	Description
tt ttt	Channel number used to access the deadstart disk equipment.
eee	Controller number to which the disk unit is connected.
vvv vvv	Physical unit number of the disk drive from which the coldstart operation is to be completed.
uuu uuu	Physical unit number of the disk drive from which the warmstart operation is to be completed.
rrr	Deadstart level.
ppp	Deadstart parameters.
xxx xxx	CMRDECK number (NOS), CMR number (NOS/BE).

The disk unit must be on a channel with no PP (for example, channel 0, 12, or 13). Refer to appendix F to determine which channels in your hardware configuration do not have PPs.

The numbers are entered in binary form; each switch represents a bit in a 12-bit PP instruction word. For models I2n Class systems, set the four leftmost bit positions for each row to 0 (they are not shown in figure 5-10).

Refer to Setting Word 13 later in this section for detailed information on word 13 parameters.

After a successful coldstart, you should immediately reset the deadstart panel for a warmstart.

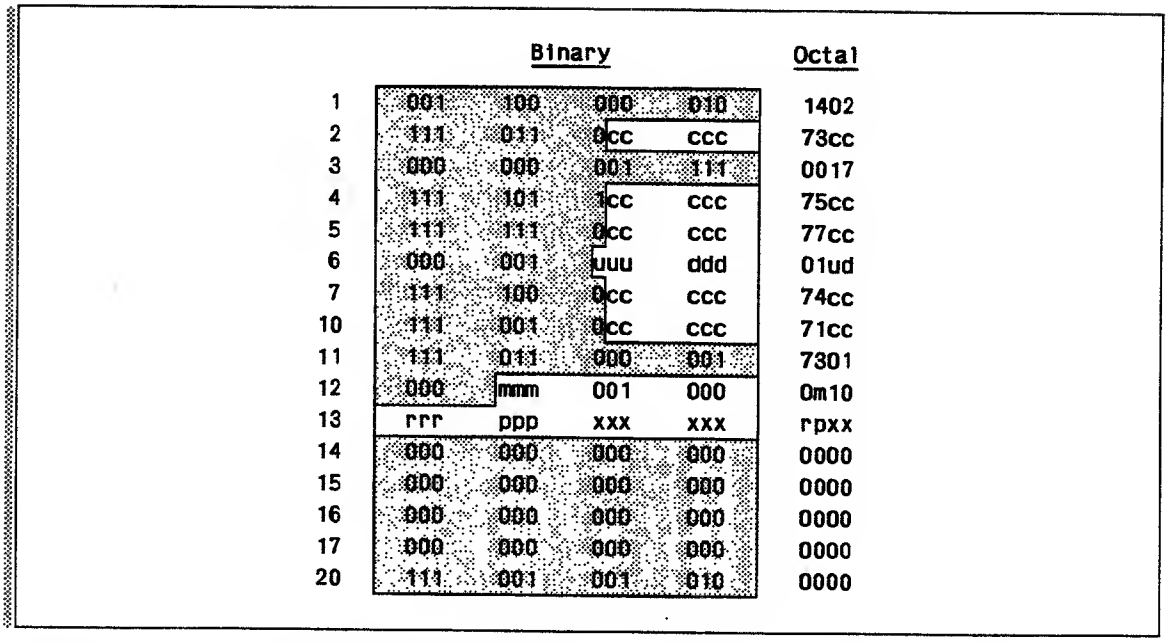
If the disk subsystem is functioning properly, there is no need to perform another coldstart after initial loading of the controlware.

Deadstart Program for Coldstart/Warmstart of 834/836 Disk Controller From Disk Unit

Use the program shown in figure 5-13 or 5-14 when coldstarting and warmstarting an 834 or 836 disk controller on an I1n Class system.

	Binary				Octal
1	000	000	000	000	0000
2	000	000	000	000	0000
3	000	000	000	000	0000
4	111	101	ccc	ccc	75cc
5	111	111	ccc	ccc	77cc
6	000	001	uuu	ddd	01ud
7	111	100	ccc	ccc	74cc
10	111	001	ccc	ccc	71cc
11	111	011	000	001	7301
12	000	mmm	001	000	0m10
13	rrr	ppp	xxx	xxx	rpxx
14	000	000	000	000	0000
15	000	000	000	000	0000
16	000	000	000	000	0000
17	000	000	000	000	0000
20	000	000	000	000	0000

Figure 5-13. Coldstart/Warmstart of 834/836 Disk From Disk Unit, With No PP on Disk Channel



	Binary				Octal
1	001	100	000	010	1402
2	111	011	ccc	ccc	73cc
3	000	000	001	111	0017
4	111	101	ccc	ccc	75cc
5	111	111	ccc	ccc	77cc
6	000	001	uuu	ddd	01ud
7	111	100	ccc	ccc	74cc
10	111	001	ccc	ccc	71cc
11	111	011	000	001	7301
12	000	mmm	001	000	0m10
13	rrr	ppp	xxx	xxx	rpxx
14	000	000	000	000	0000
15	000	000	000	000	0000
16	000	000	000	000	0000
17	000	000	000	000	0000
20	111	001	001	010	0000

Figure 5-14. Coldstart/Warmstart of 834/836 Disk From Disk Unit, With PP on Disk Channel

Descriptions of the deadstart panel parameters follow.

Parameter	Description
cc ccc	Channel number used to access the disk subsystem.
uuu	Control module number (0 through 7).
dd	Disk unit number (0 through 3).
m	Defines memory as follows: 1 = 1 Mbyte 2 = 2 Mbytes 3 = 4 Mbytes 4 = 8 Mbytes 5 = 16 Mbytes 6 = 32 Mbytes
rpxx	The instructions for setting the bits represented by these parameters are given under Setting Word 13 later in this section.

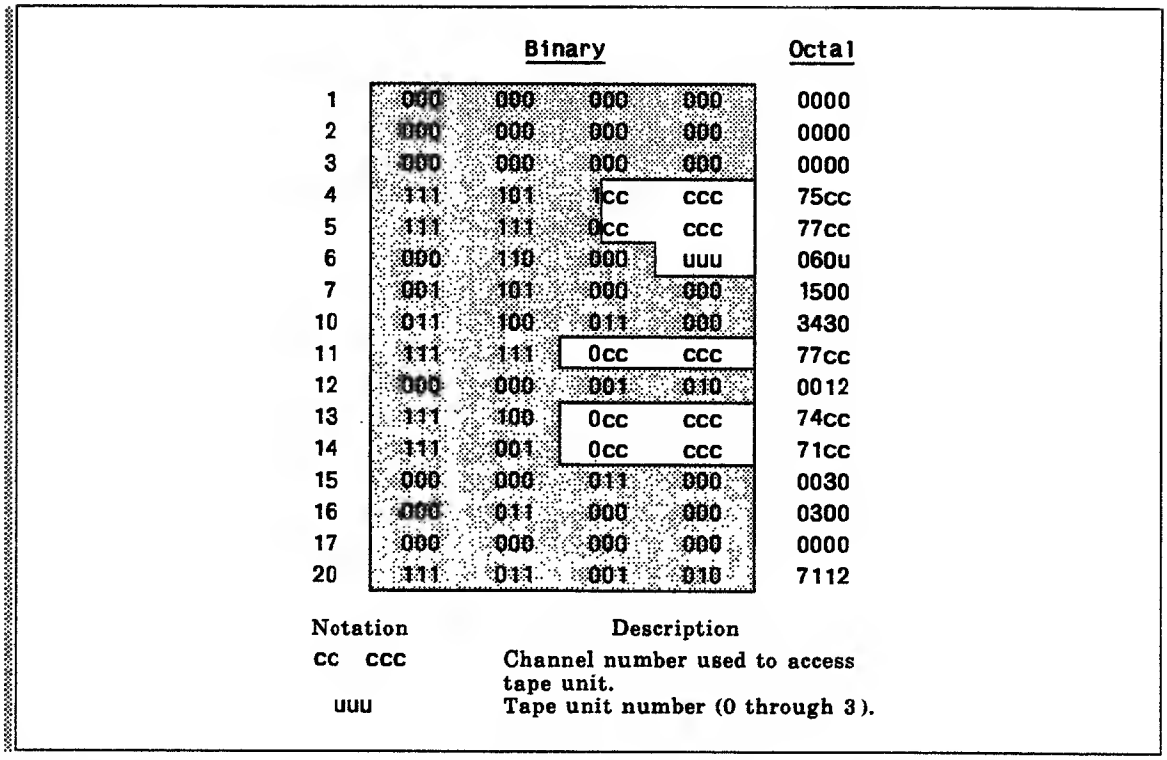
Deadstart Program for Coldstart of 639 Tape Unit Controller from Tape

Use one of the programs shown in figures 5-15 and 5-16 when coldstarting a 639 tape unit controller on an I1n and all I4n Class computer systems.

	Binary				Octal
1	001	100	000	010	1402
2	111	011	0cc	ccc	73cc
3	000	000	001	111	0017
4	111	101	0cc	ccc	75cc
5	111	111	0cc	ccc	77cc
6	000	110	000	uuu	060u
7	001	101	000	000	1500
10	011	100	011	000	3430
11	111	111	0cc	ccc	77cc
12	000	000	001	010	0012
13	111	100	0cc	ccc	74cc
14	111	001	0cc	ccc	71cc
15	000	000	011	000	0030
16	000	011	000	000	0300
17	000	000	000	000	0000
20	111	011	001	010	7112

Notation	Description
cc ccc	Channel number used to access tape unit.
uuu	Tape unit number (0 through 3).

Figure 5-15. Coldstart of 639 Tape Unit From Tape on Channel With a PP



	Binary				Octal
1	000	000	000	000	0000
2	000	000	000	000	0000
3	000	000	000	000	0000
4	111	101	1cc	ccc	75cc
5	111	111	0cc	ccc	77cc
6	000	110	000	uuu	060u
7	001	101	000	000	1500
10	011	100	011	000	3430
11	111	111	0cc	ccc	77cc
12	000	000	001	010	0012
13	111	100	0cc	ccc	74cc
14	111	001	0cc	ccc	71cc
15	000	000	011	000	0030
16	000	011	000	000	0300
17	000	000	000	000	0000
20	111	011	001	010	7112

Notation	Description
cc ccc	Channel number used to access tape unit.
uuu	Tape unit number (0 through 3).

Figure 5-16. Coldstart of 639 Tape Unit From Tape on Channel With No PP

Deadstart Program for Coldstart of 698-xx Tape Unit From Tape

Use one of the programs shown in figures 5-17 and 5-18 when coldstarting a 698-xx tape unit.

	Binary				Octal
1	011	100	000	010	1402
2	111	011	0cc	ccc	73cc
3	000	000	001	111	0017
4	111	101	1cc	ccc	75cc
5	111	111	0cc	ccc	77cc
6	000	110	000	uuu	060u
7	00	011	000	000	0300
10	000	000	000	000	0000
11	000	000	000	000	0000
12	000	000	000	000	0000
13	000	000	000	000	0000
14	000	000	000	000	0000
15	000	000	000	000	0000
16	000	000	000	000	0000
17	000	000	000	000	0000
20	111	001	001	010	7112

Notation	Description
cc ccc	Channel number used to access tape unit.
uuu	Tape unit number (0 through 3).

Figure 5-17. Coldstart of 698 Tape Unit From Tape on Channel With a PP

	Binary				Octal
1	000	000	000	000	0000
2	000	000	000	000	0000
3	000	000	000	000	0000
4	111	101	1cc	ccc	75cc
5	111	111	0cc	ccc	77cc
6	000	110	000	uuu	060u
7	00	011	000	000	0300
10	000	000	000	000	0000
11	000	000	000	000	0000
12	000	000	000	000	0000
13	000	000	000	000	0000
14	000	000	000	000	0000
15	000	000	000	000	0000
16	000	000	000	000	0000
17	000	000	000	000	0000
20	000	000	000	000	0000

Notation	Description
cc ccc	Channel number used to access tape unit.
uuu	Tape unit number (0 through 3).

Figure 5-18. Coldstart of 698 Tape Unit From Tape on Channel With No PP

Warmstart Procedures

Warmstart is the deadstart procedure used when the controlware is loaded and functioning properly. Figure 5-19 illustrates the warmstart procedure. Detailed information concerning all phases of the deadstart process follows.

The following steps summarize the procedures necessary to perform warmstart from a 639/66X/67X magnetic tape unit, 834/836 disk unit, 844 disk unit, or 885-11/12 disk unit. Use this as a checklist during warmstart.

For I1n and all I4n class systems, steps 3 and 4 must be interchanged. For more complete information, refer to Warmstart Procedure for I1n and All I4n Class systems later in this section.

1. Ensure that required mass storage devices are available and that they have packs mounted.
2. Mount the deadstart tape or pack.
3. Set the deadstart panel for warmstart (refer to Setting the Deadstart Panel for a Warmstart later in this section).
   a. Select the correct deadstart function.
   b. Select the correct CMRDECK number (NOS), DCFILE number (NOS/VE), or CMR number (NOS/BE).
4. Press the DEADSTART button on a CC545, or when a CC634B display terminal is being used as the primary operator console, complete the following steps to bring up the MAINTENANCE OPTIONS display shown in figure 5-3.
   a. Press the RESET button to reinitialize the console.
   b. Hold down the CTRL key while pressing the G key.
   c. When the message *OPERATOR ACCESS ENABLED* appears on the screen, hold down the CTRL key while pressing the R key.

   If a CC596A is being used as the primary console, complete the follow steps to bring up the DEADSTART OPTIONS display.

   a. Press the CTRL, ALT, and DEL keys simultaneously to reinitialize the console. The DEADSTART OPTIONS display will appear.
   b. HOLD down the CTRL key while pressing the F2 key and release.

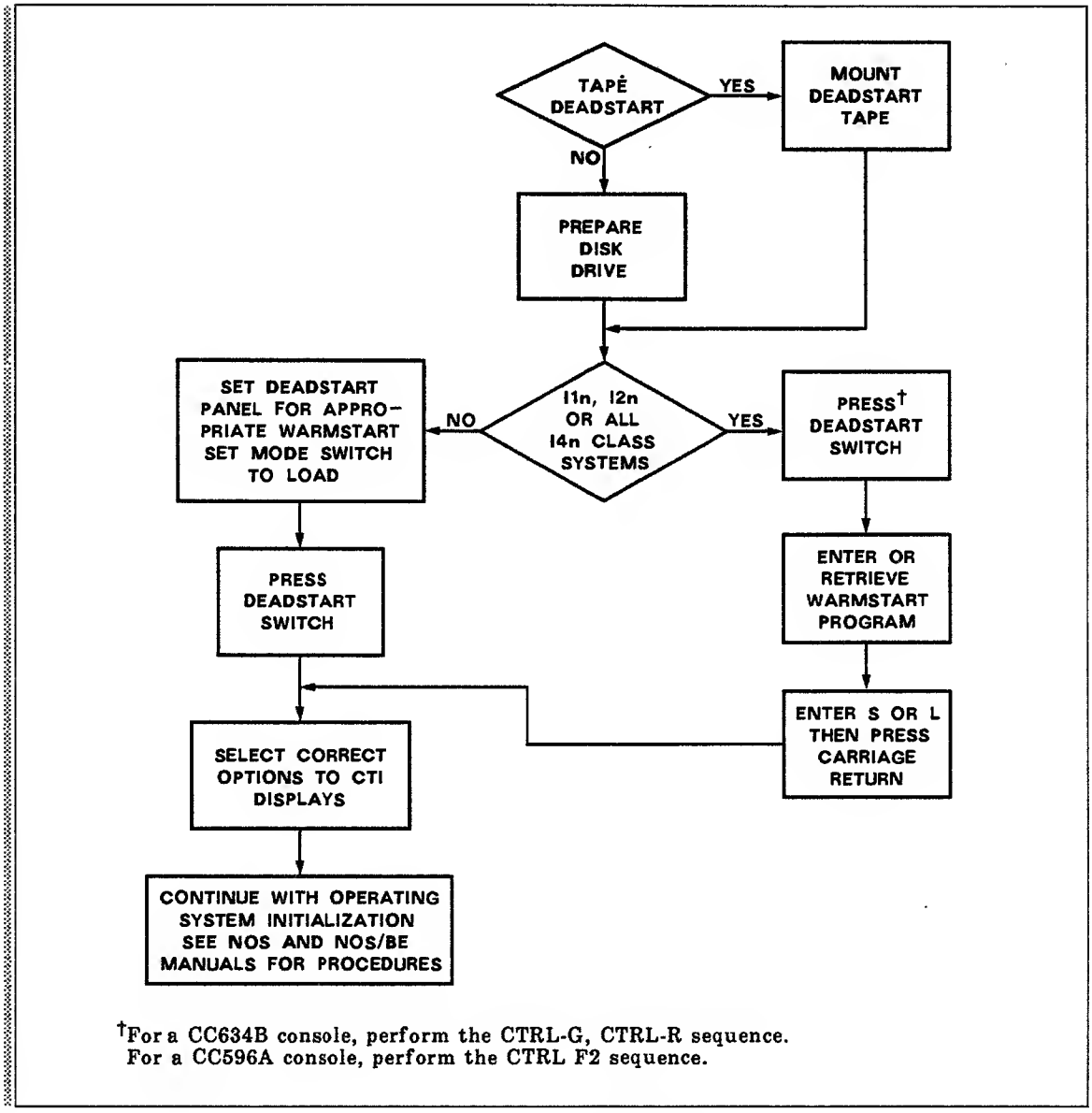
   For I1n (except 815/825) and all I4n Class systems, enter S to bring up the MAINTENANCE OPTIONS display.

   If deadstarting from a spun-down 834 or 836 disk unit, the initial display will not appear until the drive has completed spinning up (about 30 seconds).
5. Select the correct CTI options.

NOTE

The CC634B console is supported as the primary console for I2n Class systems. To select the CC634B as the primary console you must set bit 2 of deadstart panel word 12 to a one. You then initiate a deadstart by using the DEADSTART button on the CC634B, or on the CC545, the DEADSTART button or the switch on the deadstart panel.

Continue with operating system initialization or MSL loading as described in the appropriate operating system operator's guide or MSL manuals.



†For a CC634B console, perform the CTRL-G, CTRL-R sequence.
For a CC596A console, perform the CTRL F2 sequence.

Figure 5-19. Warmstart

Warmstart Procedure for I1n and All I4n Class Systems

The procedure to warmstart I1n and all I4n Class systems is similar to other computer systems except that these models do not have a deadstart panel. The warmstart programs represented by the deadstart panel switch settings on a I2n Class systems are entered as octal numbers through the I1n and all I4n Class systems console keyboard. Warmstart programs for the I1n and all I4n Class systems are identical to those for I2n Class systems except where noted.

In the various warmstart procedures described in this section, deadstarting a I1n system (except 815/825) and all I4n Class systems brings up the DEADSTART OPTIONS display shown in figure 5-1. Selecting option M on this display brings up the MAINTENANCE OPTIONS display shown in figure 5-3. Selecting option S or pressing the carriage return key brings up the INITIAL OPTIONS display (refer to section 2). Deadstarting on a model I1n system (model 815/825 only) brings up the MAINTENANCE OPTIONS display shown in figure 5-3. The DEADSTART OPTIONS display is not provided for I1n system (model 815/825 only).

The bottom line of the DEADSTART OPTIONS display (I1n system [model 815/825 only]) identifies which deadstart program is selected and is to be executed. If this is not the desired deadstart program, enter M to bring up the MAINTENANCE OPTIONS display. The following paragraphs describe how to retrieve or modify the deadstart program.

If the warmstart program is stored in the microprocessor, retrieve it by entering:

```
GP n
```

n (0 through 3) is the number of the stored program. You can change individual instructions in a program, such as unit number or other parameters, as described next. These changes are not retained across deadstarts unless this new program or a modified program is stored as described later in this section.

You can use the space bar to cycle through the stored programs. If the correct warmstart program is not stored or a new program is to be entered and stored, the program must be entered as octal numbers equivalent to the switch settings on the deadstart panels for other models.

Change the warmstart program represented by the switch settings shown in the related deadstart panel figure for your configuration by entering:

```
xx yyyyyy (or xx.yyyyyy, or xx,yyyyyy)
```

xx is octal row number of the deadstart instruction and yyyyyy is the octal number equivalent to the actual instruction.

When you enter a six-digit instruction, the first two digits of the instruction must be zeros. Leading zeros in both the octal row number and the instruction, however, need not be entered. For example, if the row number was 03 and the instruction was 000017 you could enter

```
3 17
```

and get the same setting as entering:

```
03 000017.
```

If you want the system to automatically increment the octal row number, the entry after which the increment is to occur is:

```
xx+yyyyyy
```

The + character indicates that the system is to automatically increment the octal row number. When the automatic increment is in effect, the system displays the next location after accepting the previous entry. Only the next instruction need be entered.

To cancel the automatic incrementing, press the left blank (erase) key after the octal row number appears.

To store a new program or a modified program, enter:

```
SP n
```

n (0 through 3) is the number of the program to be stored. If a program is already stored at the specified number, the new program replaces it.

After entering or retrieving the desired warmstart program, enter

```
S
```

then press the carriage return key for a short deadstart sequence, or enter

```
L
```

then press the carriage return key for a long deadstart sequence.

When system power is applied to an I1n Class system mainframe, the microprocessor automatically retrieves the warmstart program stored as program number 3 and initiates a long deadstart sequence. If you want this feature, store the warmstart program for your configuration as program number 3. If you do not want this feature, store the first word of program 3 as 000300. This instruction puts the program in PP0 into a loop. No deadstart activity occurs and no displays appear on the screen. You must press the deadstart button to bring up the initial deadstart display. You can then retrieve or enter the warmstart program you wish, and select a short or long deadstart sequence.

Setting the Deadstart Panel for a Warmstart

There are two types of warmstart panel settings: one for a deadstart device connected to a channel with a PP and the other for a device connected to a channel without a PP. When the device is connected to a channel with a PP, two panel settings are different because CYBER 70/6000 panels have fewer switches.

NOTE

When deadstarting from a 7054 or 7154 disk controller, incorrect panel settings, such as channel or unit numbers, can hang the controller. To free the controller, correct the panel settings and master clear the controller by pressing, in the following sequence, the STOP, MASTER CLEAR, and GO buttons located inside the controller chassis.

The deadstart device on which the deadstart tape or disk pack is mounted, its associated controller, and the channel used to access this equipment are identified by setting the switches shown in the unshaded area of the deadstart panels illustrated in figures 5-20, 5-21, and 5-22 (refer to appendix F to determine which channels in your hardware configuration do not have PPs).

	Binary				Octal
1	001	100	000	010	1402
2	111	011	0tt	ttt	73cc
3	000	000	001	111	0017
4	111	101	1tt	ttt	75cc
5	111	111	0tt	ttt	77cc
6	eee	ddd	ddd	ddd	eddd
7	111	100	0tt	ttt	74cc
10	111	001	0tt	ttt	71cc
11	111	011	000	001	7301
12	000	000	000	cfa	0000
13	rrr	ppp	xxx	xxx	rpxx†
14	000	000	000	000	0000
15	000	000	000	000	0000
16	000	000	000	000	0000
17	000	000	000	000	0000
20	111	001	001	010	7112

†The instructions for setting the bits represented by these parameters are given under Setting Word 13 later in this section.

Figure 5-20. CYBER 170 and I1n, I2n, and All I4n Class Systems Panel Settings for Warmstart from Channel with a PP (For Example, Channel 1, 2, or 11)

	Binary				Octal
1	001	100	000	010	1402
2	111	011	0tt	ttt	73cc
3	000	000	001	111	0017
4	111	101	1tt	ttt	75cc
5	111	111	0tt	ttt	77cc
6	eee	ddd	ddd	ddd	eddd
7	111	100	0tt	ttt	74cc
10	111	001	0tt	ttt	71cc
11	111	011	000	001	7301
12	rrr	ppp	xxx	xxx	rpxx†
13	000	000	000	000	0000
14	111	001	001	010	7112

†The instructions for setting the bits represented by these parameters are given under Setting Word 13 later in this section.

Figure 5-21. CYBER 70 and 6000 Computer Systems Panel Settings for Warmstart from Channel with a PP (For Example, Channel 1, 2, or 11)

	Binary				Octal
1	000	000	000	000	0000
2	000	000	000	000	0000†
3	000	000	000	000	0000†
4	111	101	1tt	ttt	75cc†
5	111	111	0tt	ttt	77cc
6	eee	ddd	ddd	ddd	eddd††
7	111	100	0tt	ttt	74cc
10	111	001	0tt	ttt	71cc
11	111	011	000	001	7301
12	000	000	000	cfa	0000
13	rrr	ppp	xxx	xxx	rpxx†††
14	000	000	000	000	7112

†If a 6681 data channel converter is the first equipment on the channel, or if it precedes the the deadstart device controller, words 2, 3, and 4 must be set as follows:

	Binary				Octal
2	111	101	1tt	ttt	75cc
3	111	111	0tt	ttt	77cc
4	010	001	000	000	2100

††eddd for tape; dddd for disk deadstart.
†††The instructions for setting the bits represented by these parameters are given under Setting Word 13 later in this section.

Figure 5-22. Panel Settings for Warmstart from Channel with No PP (For Example, Channel 0, 12, or 13)

Descriptions of the deadstart panel parameters follow.

Parameter	Description
tt ttt	Channel number used to access the deadstart equipment.
eee	Controller number to which the deadstart tape unit is connected.
ddd ddd ddd	Tape deadstart function; depends on device type as follows:
	001 01u uuu — 639, 698 tape units.
	010 11u uuu — 66X tape units.
	001 01u uuu — 677 tape units at 800 cpi and 679 tape units.
	011 01u uuu — 677 tape units at 556 cpi.
	u uuu represents the physical unit number on which the deadstart tape is mounted.
	ddd ddd ddd ddd — Disk deadstart function; depends on device type as follows.
	000 011 uuu uuu — 844 or 885-11/12 disk units.
	000 011 ccc uuu — 834 or 836 disk units. Control module self-checking diagnostics are executed. The initial options display usually appears after 15 to 30 seconds.
	000 101 ccc uuu — 834 or 836 disk units. Control module self-checking diagnostics are not executed. The initial options display appears instantly.
	011 011 uuu uuu — 895 disk units.
	uuu uuu or uuu represents the physical unit number on which the deadstart disk is mounted. ccc represents the physical control module equipment number of the control module connected to the deadstart disk.
c	Specifies whether system displays are to appear on the CC545 or the CC634B for I2n Class systems.
f	If set, specifies that CTI does not initialize the alternate PP when the M (maintenance) option has been selected.
a	Specifies extended deadstart sequence option for I1n, I2n, and all I4n Class systems.
rrr	Deadstart level. (Not used by NOS/VE).
ppp	Deadstart parameters.
xxx xxx	CMR number (NOS/BE) or CMRDECK number (NOS) or DCFILE number (NOS/VE).

The numbers are entered in binary form; each switch represents a bit in a 12-bit PP instruction word. For I1n, I2n, and all I4n Class systems, you must set the four leftmost bit positions for each row to 0 (they are not shown in figures 5-20, 5-21, and 5-22).

Refer to Setting Word 13 later in this section for detailed information on word 12 (CYBER 70 and 6000 computer systems) and word 13 parameters.

Setting Word 12

The a field in word 12 of the deadstart program allows you to enter the model type that HIVS/MSL 15X uses to select extended deadstart testing on I1n, I2n, and all I4n Class systems except 865 and 875. A third field, f, determines whether or not the alternate PP is initialized when maintenance (M) is selected for all models of computer systems.

The switches that represent these fields are shown in figure 5-23. The switches are set on the deadstart panel for I2n Class systems, or are entered as octal values through the I1n, I2n, and all I4n Class systems console.

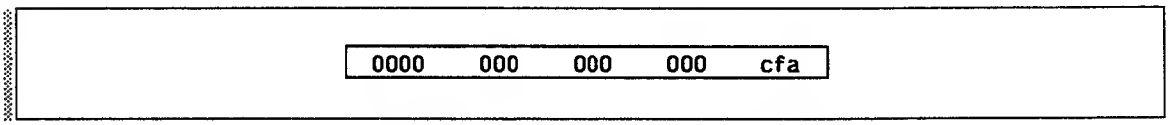


Figure 5-23. Setting Word 12 Switches

Setting	Description
c	If set, specifies that the deadstart displays will appear on a CC634B console connected to port 0 of I2n class systems. Deadstart is initiated by pressing the deadstart button on a CC634B console, or on the CC545, the DEADSTART button or the switch on the deadstart panel. If c is clear, the deadstart is initiated at the CC545 or at the deadstart panel and the displays appear on the CC545.
f	If clear when the OFF-LINE MAINTENANCE (M option) is selected from the INITIAL OPTIONS display, specifies that the alternate PP used for passing handoff data from CTI to the MSL is to be initialized. If set when the M option is selected, CTI does not initialize the alternate PP. CTI always initializes the alternate PP when the OS LOAD AUTOMATIC (A option) or the OS LOAD WITH INTERVENTION (O option) is selected from the INITIAL OPTIONS display.

Setting	Description
a	Specifies the EXTENDED DEADSTART SEQUENCE option. If you set this bit and set the LONG/SHORT DEADSTART SEQUENCE switch on the deadstart panel to the up (long) position, (or you enter L after entering or retrieving the warmstart program for an I1n and I4n 990 Class system), the system loads and executes the extended deadstart sequence (EDS). If you do not set this bit or set the LONG/SHORT DEADSTART SEQUENCE switch to the down (short) position, (or enter S after entering or retrieving the warmstart program for an I1n and I4n 990 Class system), the EDS does not occur. When this bit is set, parts of PP memories are destroyed. Refer to Performing an Express Deadstart Dump in section 6 for more information. **NOTE** When you are coldstarting a tape or disk controller from a card reader, bit f is also used as part of the channel number of the card reader. Thus, the channel number of the card reader controls whether the EDS occurs when the LONG/SHORT DEADSTART SEQUENCE switch is in the up (long) position (you entered an L after loading the warmstart program for I1n and all I4n Class systems). If the channel number is an odd number (the 2^0 bit is set), the EDS takes place. If the channel number is an even number (the 2^0 bit is not set), the EDS does not take place.

On a CYBER 176 and I1n, I2n, and all I4n Class systems excluding the 865 and 875, the alternate PP does not access central memory regardless of the setting of bit f. On all other mainframes, the alternate PP will use word zero and words 100 through 177 of central memory to determine the type of CPU on the mainframe. CTI does, however, restore the portion of central memory that it uses prior to hand-off, but the CPU exchange packages will not be valid. Thus, setting bit f when selecting the M (MAINTENANCE) option will keep CTI from accessing central memory or performing any exchange jumps of the CPU.

Setting Word 13

Three unique fields exist in word 13 (word 12 on CYBER 70 and 6000 computer systems) of the deadstart program, which allow you to select the CMRDECK, the deadstart parameters, and the level of deadstart. The switches that represent these fields are shown in figure 5-24. The switches are set on the deadstart panel for all models except I1n and all I4n Class systems; and they are entered as octal values through the I1n class system console.

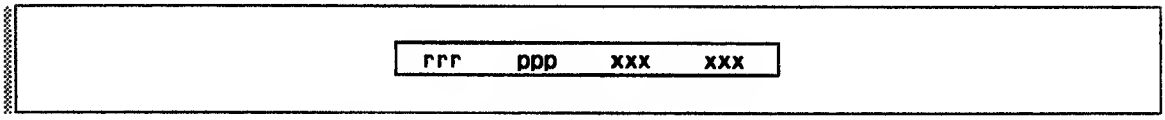


Figure 5-24. Setting Word 13 Switches

Setting	Description
rrr	Specifies the level of deadstart. (Not used by NOS/VE).
ppp	Specifies the deadstart parameters.
xxx xxx	Specifies the CMRDECK number (NOS) or CMR number (NOS/BE) or DCFILE number (NOS/VE).

Selecting the Deadstart Level (NOS)

You can select one of four levels of deadstart by setting bits 11, 10, and 9 in word 13.

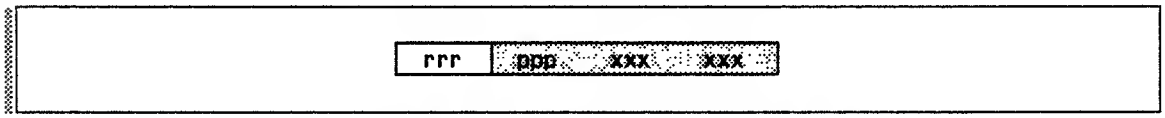


Figure 5-25. Setting Word 13, NOS Deadstart

Value of rrr (Bits 1 11-9)	Description
000	Indicates an initial or level 0 deadstart during which the system is loaded from the deadstart file. This is not considered a recovery deadstart although permanent files, queued files, and system dayfiles are recovered automatically unless those file types are initialized by the EQPDECK entry, INITIALIZE. If queued files are recovered, they are inactive (refer to the QREC utility in the NOS 2 Analysis Handbook for more information). An attempt to recover these files is made on all levels of system deadstart. A level 0 deadstart is normally specified: • For the first deadstart following a period in which the system was either inoperative or used for purposes other than NOS operations. • When a system malfunction occurred and other levels of system deadstart prove ineffective. If it is necessary to redeadstart the system (for example, due to system malfunction), it is recommended that you attempt a level 3 recovery deadstart. If you select level 0, the system is reloaded from the deadstart file. All central memory (except on I1n, I2n, and all I4n Class systems) and PP contents are destroyed by the memory confidence test.
001	Indicates a level 1 recovery deadstart during which the system, all jobs, and all active files are recovered from checkpoint information on mass storage. Permanent files are also recovered. You can do a level 1 deadstart only if the DSD command CHECK POINT SYSTEM (refer to the NOS 2 Operations Handbook) is successfully executed immediately prior to deadstart. A level 1 deadstart does not work if the contents of the extended memory are destroyed. Once a level 1 recovery deadstart begins, all central memory (except on I1n, I2n, and all I4n Class systems)[10] and PP contents are destroyed by the memory confidence test. Normally you use a level 1 recovery deadstart to allow maintenance to be performed and then to resume normal processing. It is also useful in system test situations. Never use level 1 recovery deadstart to attempt recovery from a system malfunction or to preserve queue files.

10. Central memory and extended memory are not destroyed on I1n, I2n, all I4n Class systems, and model 875 unless the V option is selected from the Operator Intervention display (refer to the Operator Intervention display for your model of computer system in sections 2 through 4 of this manual).

Value of rrr (Bits I 11-9)	Description
010	Indicates a level 2 recovery deadstart during which all jobs and active files are recovered from checkpoint information on mass storage. No attempt is made to recover the system. Instead, the system is loaded from the deadstart file as in a level 0 deadstart. In all other respects, a level 2 recovery deadstart is identical to that described for a level 1 recovery deadstart. Once a level 2 recovery deadstart begins, all central memory (except on I1n, I2n, and all I4n Class systems)[11] and PP contents are destroyed by the memory confidence test. Normally you use a level 2 recovery deadstart in system test situations; it is not recommended for the normal production environment.
011	Indicates a level 3 recovery deadstart during which all jobs, active files, and the system, with the exception of the library directory, are recovered from central memory tables. A level 3 deadstart is the only level that preserves the contents of central memory. If a deadstart level less than 3 is selected early in the deadstart process, a memory test pattern is written throughout central memory. To avoid inadvertent destruction of central memory contents when a level 3 deadstart is intended, it is recommended that you always select level 3 on the deadstart panel. If you need a deadstart level other than 3, you can specify the level by changing the DEADSTART PARAMETERS display. The library directory is recovered from mass storage. Permanent files are also recovered. A CHECKPOINT SYSTEM command must be issued prior to deadstart to prevent loss of SYSEDIT (system library modification) information. Only PP memory confidence testing occurs during a level 3 recovery deadstart; central memory is unaffected. Normally you perform a level 3 recovery deadstart following an equipment malfunction (for example, channel or PP hung), providing central memory and mass storage remain intact. Unless you can determine that central memory is no longer reliable, you should attempt a level 3 recovery following a malfunction. If level 3 recovery fails, you must perform a level 0 deadstart. **NOTE** Attempting a level 1 or 2 recovery deadstart after a level 3 deadstart fails does not correctly recover system activity and can endanger system and permanent file integrity. You must perform a level 0 deadstart.

For additional information concerning levels of deadstart, refer to the NOS 2 Operations Handbook.

11. Central memory and extended memory are not destroyed on I1n, I2n, and all I4n Class systems and model 875 unless the V option is selected from the Operator Intervention display (refer to the Operator Intervention display for your model of computer system in sections 2 through 7 of this manual).

Selecting the Deadstart Level (NOS/BE)

You can select one of four levels of deadstart by setting bits 11, 10, and 9 in word 13. The switches that represent this field of bits are shown in the unshaded area of figure 5-26.

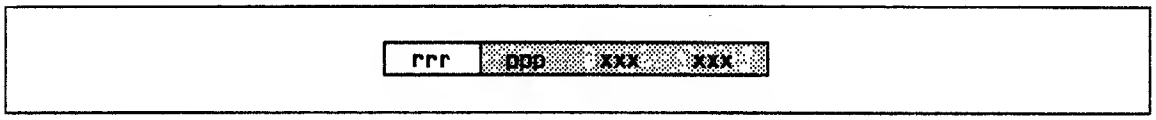


Figure 5-26. Setting Word 13, NOS/BE Deadstart

Value of rrr (Bits 11-9)	Description
000	Indicates an initial or level 0 deadstart during which the system loads the deadstart file from tape to disk before setting up the CMR libraries and directory. If CTI has been installed on a member of the system set that is turned on, you can perform an RMS deadstart on subsequent deadstarts. An RMS deadstart is not possible if the following message appears at postdeadstart. `FUTURE RMS D/S NOT POSSIBLE` For additional information about this message, refer to Entering Date and Time in the NOS/BE Operator's Guide. Upon successful completion of a level 0 deadstart, you do not need to perform any further level 0 deadstarts.
001	Indicates a level 1 recovery deadstart, which sets the CMR libraries and directory from the deadstart file on disk. You normally specify a level 1 deadstart when: • NOS/BE is being deadstarted after some other system has been using the mainframe. • A system malfunction has occurred and a level 3 deadstart proves ineffective. This level is the lowest level of deadstart that can use an RMS device as the deadstart device.

Value of rrr (Bits 11-9)	Description
010	Indicates a level 2 recovery deadstart during which all jobs and active files are recovered from a checkpoint file on RMS. You can do a level 2 deadstart only if the DSD command CHECKPOINT was successfully processed earlier. Extended memory contents are not saved when the system automatically enters IDLE mode. At level 627 of NOS/BE, the contents of extended memory are saved if the DSD command CHECKPOINT is entered by the operator. You normally use a level 2 deadstart to perform maintenance and then resume normal processing. It is also useful in system test situations. A level 2 deadstart should never be used to attempt recovery from a system malfunction.
011	Indicates a level 3 recovery deadstart, which recovers the system including all jobs and active files from central memory tables. A level 3 deadstart is the only level that preserves the contents of central memory. If a deadstart level less than 3 is selected early in the deadstart process, a memory test pattern is written throughout central memory. To avoid inadvertent destruction of central memory contents when a level 3 deadstart is intended, it is recommended that you always select level 3 on the deadstart panel. If you need a deadstart level other than 3, you can specify the level by changing the DEADSTART PARAMETERS display. Normally you perform a level 3 recovery deadstart following an equipment malfunction (for example, channel or PP hung), providing central memory, mass storage, and extended memory remain intact. Unless you can determine that CMR, central memory, or RMS tables are not intact, or if a level 3 recovery fails, you must perform a level 1 deadstart. If the tables on the system set are inaccurate, perform a level 0 deadstart. **NOTE** Level 0 is the only level that deadstarts only from tape. In all other levels, the system can be deadstarted either from tape or disk (depending on the device selected by the deadstart panel settings). If the device is tape, any level deadstart can be performed after the warning `FUTURE RMS D/S NOT POSSIBLE` appears at postdeadstart time.

For additional information concerning levels of deadstart, refer to the NOS/BE Operator's Guide.

Selecting the Deadstart Parameters

You can select deadstart parameters to control miscellaneous deadstart functions by setting bits 8 through 6 in word 13. The switches that represent this field of bits are shown in the unshaded area of figure 5-27.

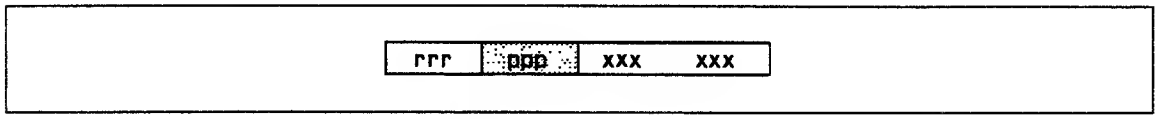


Figure 5-27. Setting Word 13, Deadstart Parameters

Setting	Description
ppp	Specifies miscellaneous deadstart functions. Refer to table 5-1.

Table 5-1. Deadstart Parameters Switch Settings

Bit Number	Switch Position	Description
8	Down	Reserved for future use.
7	Down	Reserved for future use.
6=0	Down	For NOS, indicates that the CMRDECK or the level option display is not displayed during deadstart. For NOS/VE, indicates that no operator pause is to occur during deadstart. Not used for NOS/BE.
6=1	Up	For NOS, indicates that the CMRDECK is displayed during levels 0, 1, and 2 deadstart. Level 3 options are displayed on a level 3 deadstart. For NOS/VE, indicates that operator pause is to occur during deadstart. Not used for NOS/BE.

When EDD dumps PP memory, the system destroys some contents of the PPO memory. You can save all the contents of the PPO memory by reconfiguring PPs. Refer to the EXPRESS DEADSTART DUMP option on the UTILITIES display for your model of computer system in section 2 through 4 of this manual and to appendix G for further information on how to reconfigure PPs.

Selecting the CMRDECK (NOS)

The CMRDECK defines the table sizes and other information to be used for system operations. Up to 64 CMRDECKs (numbered 0 through 77_8) can be included on the deadstart file.

NOTE

You can select the CMRDECK only during a level 0 (initial) deadstart. For a level 1 or 2 (recovery) deadstart, you must use the CMRDECK selected during the most recent level 0 deadstart. Refer to Selecting the Deadstart Level for NOS or for NOS/BE earlier in this section for information concerning the levels of deadstart.

The number of the selected CMRDECK is indicated by setting the switches (bits 5 through 0) in word 13 shown in the unshaded area of figure 5-28.

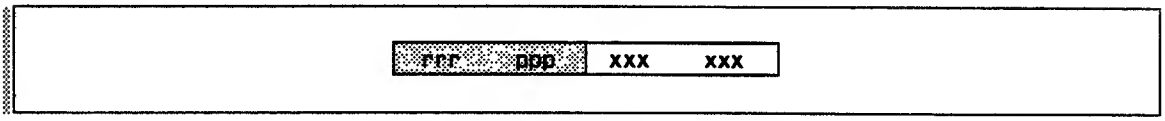


Figure 5-28. Setting Word 13, CMRDECK

Setting	Description
xxx xxx	Specifies the CMRDECK number (0 through 77_8) to be used.

For example, if CMRDECK number 26_8 is selected, the corresponding switches on the deadstart panel are set as follows:

```
rrr     ppp     010     110
```

0 indicates that the switch is in the down position; 1 indicates that the switch is in the up position. You can also specify the CMRDECK from the console keyboard by using the DEADSTART PARAMETERS display. Values entered from the DEADSTART PARAMETERS display take precedence over those specified on the deadstart panel. For example, bits 5 through 0 of word 13 on the deadstart panel (xxx xxx) could be set to select the CMRDECK most frequently used by an installation. A different CMRDECK could be selected by using the DEADSTART PARAMETERS display during a level 0 deadstart.

Selecting the CMR (NOS/BE)

The CMR defines the equipment configuration to be used for system operations. Up to 64 CMRs (numbered 0 through 77_8) can be included on the deadstart file (numbered 0 through 77_8). This provides an installation with the ability to select one of several equipment configurations when the system is deadstarted.

NOTE

You can select the CMR during a level 0 or level 1 deadstart. If it is necessary to perform a level 2 or level 3 deadstart, you must use the CMR number that was running at the time of the checkpoint (for a level 2 deadstart) or system malfunction (for a level 3 deadstart). Refer to Selecting the Deadstart Level for either NOS or NOS/BE earlier in this section for information concerning levels of deadstart.

The number of the CMR to be used is selected by setting the switches in word 13 (bits 5 through 0) shown in the unshaded area of figure 5-29.

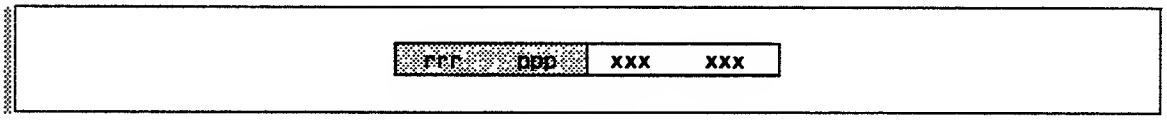


Figure 5-29. Setting Word 13, CMR

Setting	Description
xxx xxx	Specifies the CMR number (0 through 77_8) to be used.

For example, assume that CMR number 26_8 is to be used to define the equipment configuration at deadstart. In this case, the corresponding switches on the deadstart panel would be set as follows (0 indicates that the switch is in the down position; 1 indicates that the switch is in the up position):

```
xxx     xxx     010     110
```

It is not necessary to specify the CMR on the deadstart panel. In this case, the DEADSTART PARAMETERS display allows you to specify the CMR to be used from the console keyboard. In addition, values entered via the DEADSTART PARAMETERS display have precedence over those specified on the deadstart panel. For example, bits 0 through 5 of word 13 on the deadstart panel (xxx xxx) could be set to select the CMR most frequently used by an installation. Another CMR could then be selected when necessary using the DEADSTART PARAMETERS display during a level 0 or level 1 deadstart.

Selecting the DCFILE Deck (NOS/VE)

The DCFILE deck contains some of the system core commands for NOS/VE. Up to 64 DCFILE decks (numbered 0 through 77_0) can be included on the deadstart file. The number of the DCFILE deck to be used is selected in word 13 (bits 5 through 0) shown in the unshaded area of figure 5-30.

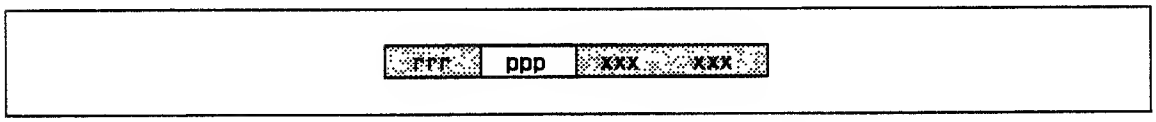


Figure 5-30. Setting Word 13, DCFILE

Setting	Description
xxx xxx	Specifies the DCFILE deck number (0 through 77_0) to be used.

Emergency CIP Repair

If a critical problem exists with one of the CIP modules, a patch to fix the problem may be required. Patches are sent to the CE in the form of a new module, providing a critical PSR or critical TAR has been received from the site. Install the new module to the deadstart disk to replace the module with the problem. Use the individual CIP module installation procedures described next.

NOTE

The patched module is a temporary solution. Control Data will combine the patched module with the other CIP modules to form a new CIP level. The new CIP tape is then sent out as an FCO. Install the CIP FCO to the deadstart disk to replace the patched module.

Emergency CIP repair considerations:

- Manual operations can only be executed from the CIP tape.
- When manual operations options are used to install microcode or EI, the system appends an asterisk to the module name. The asterisk denotes to support personnel that the module has been modified. You display the module name by selecting option L, DISPLAY CIP COMPONENT INFORMATION, from the UTILITIES display.
- Do not use the manual operations to mix components of CIPs of different levels; that is, do not install only the microcode from a new CIP.

  Microcode released with the initial CIP release (November 1983) does not work with CTI at L149 (or before).

Installing an Individual CIP Module

Install the patched module using this procedure.

1. Mount the current CIP tape on a tape drive.
2. Mount the tape containing the patched module on another tape drive.
3. Set the deadstart program for a deadstart from the CIP tape.
4. Initiate deadstart. The INITIAL OPTIONS display appears.
5. Press the carriage return key to select the BUILD DEADSTART DISK option. The BUILD DEADSTART DISK display appears.
6. Enter an M to select manual operations. The MANUAL OPERATIONS display appears.
7. The next steps depend upon the type of module that was patched: EI, microcode, MSL, HIVS, or CTI. Use the following applicable procedure.

Replacing EI, Microcode, SCD, or MDD

1. Enter D while displaying the MANUAL OPERATIONS display to replace EI, microcode, SCD, MDD, DFT, or DPB.
2. Enter:
   a. The disk channel and unit number of the deadstart disk then press the carriage return key, or
   b. The tape type, channel, equipment, and unit numbers of patched module tape then press the carriage return key.
3. Enter B to replace microcode, C to replace EI, D to replace CC634B SCD, E to replace MDD, or F to replace DFT.
4. The patched module is installed to disk.
5. Initiate deadstart.

Replacing an MSL Module

1. Enter T while displaying the MANUAL OPERATIONS display to install MSL. The initial TDX display appears.
2. Press the carriage return key.
3. Enter the channel and unit of the deadstart disk.
4. Enter the device type, channel, equipment, and unit of the tape drive containing the patched MSL module then press the carriage return key. The TDX OPTIONS display appears.
5. Enter A to build MSL on disk from tape. The MSL INSTALLATION options appear.
6. Enter F to perform a full installation in MSL/OS shared disk mode. The system asks you if you want to save command buffers.
7. Enter Y to save command buffers or N to load command buffers from tape.
8. Press the carriage return key when TDX displays:

```
COPY FROM
-CR- = 1st NAME
```

9. Press the carriage return key when TDX displays:

```
COPY THRU
-CR- = LAST NAME
```

10. Enter Y if you want TDX to perform a write verify function when transferring the data, or N for no verification. MSL installation is complete when TDX displays the last cylinder, track, and sector used for the copy.
11. Initiate deadstart.

4. Equipment number must be zero for all disk drives. Press the backspace key to change disk channel number, or press the carriage return key. The display adds the following line when carriage return is pressed.

   ```
   UNIT - 00
   ```

5. For 834/836 disk drives, 00 is interpreted as cu, where c = control module numer, and u = unit number. Press the carriage return key to accept control module 0, unit 0, or enter alternate values, then press the carriage return key.

   For 844 drives, unit number must be in the range 00 - 07. Press the carriage return key to accept unit 00, or enter an alternate unit number, then press the carriage return key.

   For 885 drives, unit number must be in the range 40 - 57. Enter a valid unit number, then press the carriage return key.

   For 895 disk drives, 00 is interpreted as su, where s = storage director number, and u = unit number. Press the carriage return key to accept storage director 0, unit 0, or enter alternate values, then press the carriage return key.

   After the carriage return key has been pressed, the screen is cleared and the following line appears.

   ```
   ENTER TAPE TYPE - t

   (1=66X, 2=63X/67X/698)
   ```

   NOTE

   The tape parameters displayed are initially defaulted to the CIP deadstart tape device. When entering these parameters, enter the values for the tape which contains peripheral microcode. If peripheral microcode is on the CIP tape, press the carriage return key for each parameter.

6. Press carriage return to accept t as shown, or enter an alternate tape type. The display adds the following line.

   ```
   CHANNEL - cc
   ```

7. Press the carriage return key to accept cc as shown, or enter an alternate channel, then press the carriage return key. The display adds the following lines.

   ```
   EQUIPMENT - e


   (BS) - BACKSPACE TO PREVIOUS ENTRY
   ```

8. Press the backspace key to change the tape channel number. Press the carriage return to accept e as shown, or enter an alternate equipment number, then press carriage return. The display adds the following line.

   ```
   UNIT - uu
   ```

9. Press the backspace key to change the tape equipment number. Press the carriage return key to accept uu as shown, or enter an alternate unit number, then press the carriage return.

   The system now begins the peripheral microcode load/install process. Self-explanatory messages are presented during the process to inform the operator of the progress of the installation process.

10. When the process is complete, one of the following displays is presented on the screen, depending upon the disk type selected.

```
834             836             844/885         895

INSTALLED       INSTALLED       INSTALLED       INSTALLED
MA462-XX        MA462-XX        MA721-XX        MA464-XX
MH422-XX        MH424-XX
MD422-XX        MD424-XX

ENTER (CR) TO CONTINUE.

(XX is the revision number of the peripheral microcode(s) installed.
```

11. To load/install peripheral microcode to another device, press the carriage return key. The ENTER DISK TYPE display will appear on the screen. Repeat steps 2 through 5, and step 11 for each drive.

Clear the reserved status of the disk unit to initiate automatic retry.

If the disk selected for the CDA utility is a fixed module drive whose READ ONLY switch is set, the following message appears:

```
READ ONLY SELECTED.
```

Turn off the READ ONLY switch and press the carriage return key to initiate automatic retry.

4. Replace microcode on deadstart disk.
   a. Enter B while displaying the REPLACE CTI/MSL DISK AREA MODULE display.
   b. The REPLACE CTI/MSL DISK AREA MODULE display appears when modules have been replaced.
5. Replace default parameter deck on deadstart disk from CIP tape.
   a. Enter A while displaying the REPLACE CTI/MSL DISK AREA MODULE display.
   b. The REPLACE CTI/MSL DISK AREA MODULE display appears when modules have been replaced.
6. Replace EI on CTI/MSL disk area.
   a. Enter C while displaying the REPLACE CTI/MSL DISK AREA MODULE display.
   b. The REPLACE CTI/MSL DISK AREA MODULE display appears when installation is complete.
7. Replace CC634B SCD on the disk.
   a. Enter D while displaying the REPLACE CTI/MSL DISK AREA MODULE display.
   b. The REPLACE CTI/MSL DISK AREA MODULE display appears when installation is complete.
8. Replace MDD on the disk.
   a. Enter E while displaying the REPLACE CTI/MSL DISK AREA MODULE display.
   b. The REPLACE CTI/MSL DISK AREA MODULE display appears when installation is complete.
9. Replace DFT module on the disk.
   a. Enter F while displaying the REPLACE CTI/MSL DISK AREA MODULE display.
   b. The REPLACE CTI/MSL DISK AREA MODULE display appears when installation is complete.

10. Replace SCI

    a. Enter it while displaying REPLACE CTI/MSL DISK AREA MODULE display.

    b. The CAU initial options display appears when installation is complete.

11. Replace MSL module to disk.

    a. Press the carriage return key or enter B while displaying the INITIAL OPTIONS display. The BUILD DEADSTART DISK display appears.

    b. Enter M. The MANUAL OPERATIONS display appears.

    c. Enter T. The console displays:

```
        TDX
DISK AND TAPE TRANSFER UTILITY
   CR TO CONTINUE
```

    d. Press the carriage return key then enter TDX parameters as prompted. The TDX option display appears upon completion of these entries.

    e. Enter A to build MSL from tape.

    f. Enter F to select MSL/OS Shared Disk mode. Programs are installed at the predefined area of the disk.

    The following message appears.

```
SAVE COMMAND BUFFER AREA
Y = YES  N = NO
```

    g. Enter N in response to the above message (you do not have to press the carriage return key). TDX initializes the PNT and SRT and presents the following display.

```
COPY FROM
-CR- = 1ST NAME
```

    h. Press the carriage return key to cause TDX to begin copying with the first program it encounters. When the COPY FROM selection is complete, TDX presents the following display.

```
COPY THRU
-CR- = LAST NAME
```

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MDD is a PP program that utilizes the Two Port Multiplexer (TPM) on the CDC CYBER I1n, I2n, and all I4n Class systems (excluding models 865 and 875) to provide a window to the hardware status. This program is built to run on the NOS, NOS/BE, or NOS/VE operating system. Once initiated, MDD detaches itself from the operating system until directed via the MDD console to terminate. MDD is not dependent on an operating system and should function if the operating system malfunctions due to hardware or software problems. As of the CIP level 9 release, MDD is contained in SCI (combined VPB, SCD and MDD). If SCI is already executing in a PP when MDD is initiated, MDD mode is turned on for that copy of SCI. A new copy is not loaded. This means that one copy of SCI services both MDD and the CC634B/CC596A console. If NOS/VE is executing in a dual state environment when MDD is initiated, the MDD must be initiated from the NOS/VE console.

MDD Terminal Control

MDD is designed to allow sharing of the communications port (and any terminal connected to it). On a CDC 721 terminal, if the user presses the F7 key, MDD releases the port (and thereby the terminal) if another driver wishes to use the port. If no other driver has signaled a request for the port, MDD responds with a beep. If a terminal other than a CDC 721 is used, the operator should enter an RS (Record Seperator = 1E hexadecimal) and a lower case w.

On the CYBER 930 there is only a subset of the MDD command set available. Refer to command summary to identify which commands are not available denoted with an asterisk.

Command Syntax

MDD receives commands from the MDD console to:

- Display or change central memory (60 or 64 bit)
- Display, interpret, or change the contents of registers
- Display or change control store (64 or 128 bit)
- Display the DFT block or buffers
- Set flags to control DFT processing
- Stop or start PPs
- Stop or start a CPU

Using any of the display commands should have no effect on an operating system. Most MDD commands allow position dependent parameters, keywords, or a combination of both. This means that for the command whose syntax is:

```
DR element RN=register_number RC=repeat_count
```

where element can be one of the keywords i, m, or p, all of the following do the same thing.

```
DR i RN=30 RC=9
DR i 30 9
DR i RN=30 9
```

The delimiter between parameters in MDD commands can be either a space or a comma. Parameters can be positioned with multiple commas. All of the examples below are correct.

```
DB AD=0,WC=10
DB,,WC=10
DB 0 10
DB,,10
```

MDD Initialization

MDD can be initiated on either Port 1 or Port 0 of the Two Port Mux. MDD waits indefinitely for the Carrier ON status. MDD cannot be directed to terminate if initiated by CIP.

To bring up MDD via CTl, select option M and enter:

```
MDD=YES
PORT=port number desired
```

CAUTION

This mode should only be used to track problems associated with an operating system deadstart.

NOTE

When deadstarting a mainframe via the Two Port Mux, it is possible for the SCD and MDD to share the same port. If this occurs, the operator needs to use the F7 key to toggle use of the terminal between these two functions.

The timeout parameter has been removed from the NOS X.MDD command. To bring up MDD under NOS, type the following under Dynamic System Display (DSD).

```
X.MDD(p)
```

where p is an octal digit. If p=1, MDD uses Port 0 of the Two Port Mux. If p is any other value or not specified, then MDD uses Port 1.

In a dual state environment, MDD must be initiated from the NOS/VE side through use of the CHANGE_MDD_OPERATING_MODE command. However, MDD could be initiated from the 170 side before NOS/VE deadstart is initiated.

To bring up MDD under NOS/BE, type the following under DSD.

```
UNLOCK,passwrd.
MDD,n.
LOCK.
```

The n parameter follows the protocol for the p parameter in NOS. n specifies the port number, zero or one.

CHANGE_MDD_OPERATING_MODE Command

Enter this command only under direction of a site analyst.

Purpose To turn MDD on or off or to change the port on which its output is displayed.

Format **CHANGE_MDD_OPERATING_MODE** *a p*
a=ON_OR_OFF
p=PORT_NUMBER

Parameters *a*

Specifies whether MDD is to be turned on or off.

b

Specifies the port number MDD will use when displaying output.

Remarks

- This command must be entered from the Critical Display Window.
- There is no abbreviated form of this command.
- SCI/MDD can only be active on one port.

Conventions

Delimiters	Only a comma or space may be used.
Parameter Options	These are listed in the explanatory text following the parameter, if applicable.
Required Parameters	These are listed in the explanatory text following the parameter, if applicable.
Parameter Defaults	These are listed in the explanatory text following the parameter, if applicable.

Central Memory Display Commands

All of the central memory display commands save the address and word_count parameters. The default values for the address and word_count on the next central memory display are obtained from these values.

Display Bytes

Purpose The DB command displays 64-bit memory in 8-bit byte format (one word per line, eight groups of two hexadecimal digits per word).

Format **DB**

AD=byte_address
WC=word_count

Parameters *AD*

Starting byte ADdress for the central memory display (hexadecimal). This value is rounded down to the nearest word boundary. The default value is zero or the address used by the most recent memory, control store, or DFT command.

WC

Number of words to display (hexadecimal). The default is 8 or the most recently entered value.

Display CM

Purpose The DC command displays the least significant 60 bits of central memory in octal word format (one word per line, twenty octal digits per word). Display CM is not available on CYBER 930.

Format **DC**

AD=octal_address
WC=word_count

Parameters AD

Starting word ADdress for the central memory display (octal). The default value is zero or the address used by the most recent memory, control store, or DFT command.

WC

Number of words to display (octal). The default is 8 or the most recently entered value.

Display Hexadecimal CM

Purpose The DH command displays 64-bit memory in hexadecimal word format (one word per line, 16 hexadecimal digits per word).

Format

DH
AD=word_address
WC=word_count

Parameters *AD*

Starting word address for the central memory display (hexadecimal). The default value is zero or the address used by the most recent memory, control store, or DFT command.

WC

Number of words to display (hexadecimal). The default is 8 or the most recently entered value.

Display Virtual Memory

Purpose The DM command can be used to display memory in a virtual environment. When first initiated, MDD initializes all of its default virtual memory parameters from the hardware registers. These values may be changed if desired. The memory is displayed by first displaying the segment number and the memory in byte format (eight groups of two hexadecimal digits) with an eight-digit relative byte offset for an address. The Real Memory Address (RMA) for the first word displayed is saved to be used as the default for the DC, DH, and DB commands. This allows the user to determine the RMA for an arbitrary PVA by simply entering a DB, DH, or DC command. The PVA entered is retained as the default PVA for the next execution of the DM command.

NOTE

MP, JP, PT, PS, and PL are reinitialized when the SE command is entered. The SE command is necessary if MDD is activated prior to NOS/VE deadstart.

Format

DM
PVA=virtual_address
WC=word_count
xp=exchange_package
PT=page_table_rma
BO=byte_offset
PS=page_size_mask
PL=page_table_length

Parameters *PVA*

Process Virtual Address to use as the starting memory address for the display. This is an eleven-digit hexadecimal number consisting of three digits of segment number and eight digits of byte offset. The default is all zeros or the most recently entered value.

WC

The number of words to display (hexadecimal). This defaults to the previously used value.

xp/MPS

xp/JPS

xp/XPS

EXchange Package address to be used to obtain the segment table address used in converting a PVA to a System Virtual Address (SVA) prior to searching the Page Table. Just specifying the keyword uses the value last specified for the keyword. Specifying xp=hex_address changes the value that is associated with the keyword xp. If this parameter is omitted, then the keyword last entered on a DM command is assumed. The initial defaults for MP and JP are the values of the monitor_state and job_ process registers when MDD is started up.

PTA

Page Table Address. The initial default is the page table address when MDD is started up. The default is changed by entering this parameter.

BO

Byte Offset. This parameter can be used if you wish to display a different offset in the same segment. If this parameter is used, then the PVA parameter should not be used.

PS

Page Size mask. Hexadecimal number for the new page size mask. The initial default is the page size mask when MDD is started up. The default is changed by entering this parameter.

PL

Page table Length. Hexadecimal number for the new Page Table length. The initial default is the page table length when MDD is started up. The default is changed by entering this parameter.

Display Next Central Memory Block

Purpose The + repeats the last CM display command using a new starting address. If no increment is given, then the CM displayed starts where the previous display ended. If the increment is specified, the starting address for the memory displayed is equal to the current_starting_address plus the increment.

Format

```
+
    increment
```

Parameters *increment*

Optional starting_address increment when the CM display command is repeated. The increment is interpreted in the same manner as the word or byte count of the previous memory display command.

Display Previous Central Memory Block

Purpose The - repeats the last CM display command using a new starting address. If no decrement is given, then the CM displayed ends where the previous display started. If the decrement is specified, the starting address for the memory displayed is equal to the current_starting_address minus the decrement.

Format

```
-
    decrement
```

Parameters *decrement*

Optional starting_address decrement when the CM display command is repeated. The decrement is interpreted in the same manner as the word or byte count of the previous memory display command.

Central Memory Change Commands

The following commands are used to change central memory. Each attempt to write central memory will check the address against the OS Bounds Register. If the write would cause an OS Bounds violation, MDD toggles the OS Bounds Register and performs the central memory write commands.

Enter Bytes into Memory

Purpose The EB command changes memory one byte at a time for 1 to 33 bytes. The byte address is retained for successive memory display commands.

Format EB

AD=byte_address
B1...Bn

Parameters *AD*

Starting byte ADdress (hexadecimal) to be changed. The address is the exact byte address and need not be on a word boundary. The address must be specified.

B1...Bn

The new values for the bytes starting at the byte address specified by the AD parameter. Each value is a one- or two-digit hexadecimal number. One or more bytes may be changed at a time.

Enter Central Memory

Purpose The EC command changes one word of 60-bit memory to the specified octal value. The address changed is retained for successive memory display commands. This command is not available in CYBER 930.

Format EC

AD=word_address
WV=word_value

Parameters *AD*

The word ADdress (octal) to be changed. The address must be specified.

WV

The new value to be entered into the address given by AD. This is a 1- to 20-digit octal value, right justified. The default for this parameter is zero.

Maintenance Register Display Commands

Display Maintenance Registers

Purpose The DR command displays either a single maintenance register, a list of consecutive registers, or a predefined list of registers in a specific element (IOU, memory, processor). On a dual I4 system, IOU0 is the only IOU which may be accessed by way of this command. The display consists of the register number (hexadecimal), the contents of the register in 16 hexadecimal digits, and a description of the register (only for the predefined list option). This command is not available on CYBER 930.

Format

DR
element
RN=register_number
RC=repeat_count

Parameters *element/x*

Identifies the element from which to read the register(s). The only valid keys are: I for IOU, M for memory, and P for processor. The initial default is P. Once a value has been specified it becomes the default. On a dual I4 system, IOU0 is the only IOU which can be accessed by way of this command.

RN

Register Number to display (hexadecimal). If this parameter is omitted, the predefined list based on the element and mainframe model is used. On dual I4 systems, IOU1 registers cannot be displayed with this command.

RC

Repeat Count (hexadecimal). This parameter when specified with the RN parameter defines the number of additional registers to display. This parameter has no effect if RN is not specified.

The default registers displayed depends upon which element is specified.

Enter New Maintenance Register Value

Purpose The ER command allows the user to change the value of a register in an element on the maintenance channel. On a dual I4 system, IOU0 is the only IOU which can be accessed by way of this command. This command is not available on CYBER 930.

CAUTION

Not all registers can be safely changed while an operating system is up. Some registers cannot be written by MDD for hardware reasons. The user should be familiar with the register he/she is trying to alter as mistakes can lead to unpredictable and unreliable results.

Format **ER**
element
RN=register_number
RV=register_value

Parameters *element/x*

Identifies from which element to write the register. The only valid keys are: I for IOU, M for memory, and P for processor. The initial default is P or the most recently entered value. On a dual I4 system, IOU1 registers cannot be entered with this command.

RN

The required hexadecimal Register Number to change.

RV

Value to write into the register. This may be a 1- to 16-digit hexadecimal number. The value is written to the register right justified.

Clear Errors on Maintenance Element

Purpose The CE command clears errors on the specified element. On a dual I4 system, IOU0 is the only IOU which can be accessed by way of this command.

Format **CE**
element

Parameters *element/x*

The element for which the Clear Errors function is executed. The only valid keys are: I for IOU, M for memory, and P for processor. The default is the most recently entered value from an ER, DR, CX, or CE command. On a dual I4 system, IOU1 errors cannot be cleared with this command.

Master Clear a Maintenance Element

Purpose The CX command master clears a specified element. On dual I4 systems, IOU0 is the only IOU which may be accessed by way of this command. This command is not available on CYBER 930.

WARNING

This command should not be used if an operating system is functioning.

Format CX
element

Parameters *element/x*

The element for which the master clear function is executed. The only valid keys are: I for IOU, M for memory, and P for processor. The default is the most recently entered value from an ER, DR, CX, or CE command. On a dual I4 system, IOU1 cannot be master cleared with this command.

Interpret MCR Bit Settings

Purpose The MC command gives a brief description of each bit set in either the provided MCR value or from the active MCR register. If no parameter is supplied and no bits in the active MCR register are set, the user is informed that the register is clear. This command is not available on CYBER 930.

Format MC
RV=mcr_contents

Parameters *RV*

The MCR Register Value to be interpreted. If not specified, then the current MCR is read and its contents are used.

Interpret UCR Bit Settings

Purpose The UC command gives a brief description of each bit set in either the provided UCR value or from the live UCR register. If no parameter is supplied and no bits in the live UCR register are set, the user is informed that the register is clear. This command is not available on CYBER 930.

Format UC
RV=ucr_contents

Parameters *RV*

The UCR Register Value to be interpreted. If not specified, then the current UCR is read and its contents are used.

Display PP Register Values

Purpose The DP command displays the selected register for all the PPs in the IOU0. On dual I4 systems, PP register values in IOU1 cannot be displayed by way of this command. The registers are displayed as six-digit octal numbers, five to a line. The first line displays PPs 0 to 4. The second line displays PPs 5 to 11. The third line displays PPs 20 to 24 and the fourth line PPs 25 to 31. If CIO PPs are present, a fifth line displays CIO PPs 0 to 4. If a second barrel of CIO PPs is present, then a sixth line displays CIO PPs 5 to 11. This command is not available on CYBER 930.

Format

DP
register

Parameters *register/x*

Identifies which PP register to be displayed for each PP. The valid keys are: P for the program counter, Q for the Q register, K for current instruction, and A for the accumulator. The initial default is P or the most recently entered value.

Idle PP

Purpose The IP command idles the selected PP in IOU0 by doing a hardware idle on the PP. On a dual I4 system, PPs in IOU1 cannot be idled by way of this command. Once idled, the PP can only be restarted by way of MDD by execution of the RP command. The A register is destroyed during the restart. This command is not available on CYBER 930.

Format

IP
PP=pp_number
pp_type

Parameters *PP*

PP number to idle. This must be an octal number 0 to 11 or 20 to 31. This parameter is required.

pp_type/x

The pp type is used to differentiate between NIO and CIO PPs. The only valid keys are N for NIO and C for CIO. The initial default is N or the most recently entered value.

Restart PP at Specified Address

Purpose The RP command restarts a PP in IOU by deadstarting the PP and setting a new P register. On a dual I4 system, PPs in IOU1 cannot be restarted by way of this command. This command is not available on CYBER 930.

CAUTION

The deadstart load destroys words 0 and 1 as well as the A register of the specified PP.

Format **RP**
PP=pp_number
AD=starting_address
pp_type

Parameters *PP*

PP number to restart. This must be an octal number 0 to 11 or 20 to 31. The parameter is required.

AD

ADdress of first instruction to be executed. The address is an octal value from 0 to 7776. This parameter is required.

pp_type/x

pp_type is used to differentiate between NIO and CIO PPs. The only valid keys are N for NIO and C for CIO. The initial default is N or the most recently entered value.

Halt Processor

Purpose The HP command unconditionally halts the CPU. If used on a dual CPU system, the CPU that is halted is the one specified by the SE command. The initial default is CPU0. This command is not available on CYBER 930.

CAUTION

The HP command should only be used by trained individuals that understand the hardware they are using. For example, if the user enters the HP command before he/she enters an SD T ON command, DFT recognizes that CPU as being halted and attempts to restart it.

Format **HP**

Start Processor

Purpose The SP command attempts to restart the CPU by restarting the microcode. Depending on the reason the processor halted, this may or may not be successful. A specific microcode address may (optionally) be supplied. If used on a dual CPU system, the CPU that is started is the one specified by the SE command. The initial default is CPU 0. This command is not available on CYBER 930.

Format

SP
AD=micro_code_address

Parameters *AD*

Optional four-digit hexadecimal microcode ADdress. If no address is supplied, the CPU is restarted from where it was stopped.

Set CPU Value

Purpose The SE command specifies which CPU is used when entering DR, ER, RF, HP, SP, DS, DK, ES, EK, CX, CE, MC, and UC commands. It also resets the MP, JP, PT, PS, and PL values on the DM command to the appropriate values for the CPU selected.

Format

SE
CP=n

Parameters *CP*

The number of the CPU to be used for future commands which reference CPU registers. Allowed values are zero or one. The initial default is zero.

Display the Register File for a Processor

Purpose The RF command displays the register file for the CPU which has been previously selected by the SE command. This command is not available on CYBER 930.

NOTE

The CPU must be halted to execute this command on some models and must be running on others.

Format

RF
AD=address
WC=word_count

Parameters *AD*

Hexadecimal register number to display. The default value is 0.

WC

The number of entries to display (hexadecimal). The default value is 10 or the most recently entered value from a DS, DK, or RF command.

DFT Commands

Display DFT Block

Purpose The DF command displays the DFT control block or the contents of a DFT maintenance register buffer. Invalid register entries are suppressed. If DFT has not set the verified (or rejected) flag, the message NO DFT is output to the terminal.

NOTE

The address of the DFT control block or buffer of interest is saved so the next memory display command also displays this portion of memory.

Format **DF**
MB=maintenance_register_buffer_number

Parameters *MB*

Maintenance register Buffer number to display (0 through F hexadecimal). If the number is beyond the number of buffers on the specific mainframe, the command terminates. If the buffer number entered is 20 (hexadecimal), then the Model Dependent Buffer is displayed.

Set DFT Flag

Purpose The SD command sets (or clears) a flag in the DFT control word to instruct DFT to freeze on (or process) corrected or uncorrected errors, or to ignore errors. If the uncorrected and/or the corrected error flag is set, and the appropriate error occurs, DFT halts all CPUs, logs errors, and waits for the flag to be cleared to clear the registers and restart all processors. If the flag to ignore errors is set, DFT stops reading maintenance registers thereby ignoring any errors until the flag is cleared. If DFT has not set the verified flag, the message `DFT NOT VERIFIED` is output to the terminal.

NOTE

The SD command may cause the OS Bounds to be toggled for MDD.

In order to cause DFT to halt all processing when any error occurs, the user must enter both the SD U ON and SD C ON commands.

Format

SD
error_type
DFT_action

Parameters *error_type/x*

This keyword indicates which flag to set (or clear) in the DFT control word by MDD. The allowed values of U for uncorrected errors and C for corrected errors cause DFT to process errors as indicated above if the flag is set or to continue normal processing if the flag is clear. The value T causes DFT to ignore errors if the flag is set. The default changes when a new value is entered.

DFT_action/x

The ON keyword sets the DFT flag and the OF keyword clears the flag. The initial default is OF. The default changes when a new value is entered.

Control Store Commands

Display Eight-Byte Control Store

Purpose The DS command displays 64-bit control store. This command is not available on CYBER 930.

NOTE

The processor must be halted to execute this command.

Format **DS**
AD=address
TC=type_code
WC=word_count

Parameters *AD*

The four-digit hexadecimal ADdress to begin displaying the control store memory. The default is 0 or the most recently entered value from an DS, DK, ES, EK, DFT command, or memory command.

TC

The one-digit Type Code for the desired control store. The default is 0 or the most recently entered value from a DK, DS, EK, or ES command.

WC

The number of words of control store to display. The default value is 10 or the most recently entered value from a DB, DC, DH, DS, DK, or RF command.

Display Sixteen-Byte Control Store

Purpose The DK command displays 128-bit control store. This command is not available on CYBER 930.

NOTE

The CPU must be halted to execute this command.

Format

DK
AD=address
TC=type_code
WC=word_count

Parameters *AD*

The four-digit hexadecimal ADdress to begin displaying the control store memory. The default is 0 or the most recently entered value from an DS, DK, ES, EK, DFT command, or memory command.

TC

The one-digit Type Code for the desired control store. The default is 0 or the most recently entered value from a DK, DS, EK, or ES command.

WC

The number of words of control store to display. The default value is 10 or the most recently entered value from a DB, DC, DH, DS, DK, or RF command.

Enter Eight-Byte Control Store

Purpose The ES command changes a word in 64-bit control store. The new values are to be entered byte-wise and are entered left justified. This command is not available on CYBER 930.

NOTE

The CPU must be halted to execute this command.

Format

ES
AD=address
TC=type_code
B1...Bn

Parameters *AD*

The four-digit hexadecimal ADdress to begin displaying the control store memory. This parameter is required.

TC

The one-digit Type Code for the desired control store. The default is 0 or the most recently entered value from a DK, DS, EK, or ES command.

B1...Bn

The new values for the bytes starting at the byte address specified by the AD parameter. Each value is a one- or two-digit hexadecimal number. One or more bytes may be changed at a time.

Enter Sixteen-Byte Control Store

Purpose The EK command changes a word in 128-bit control store. The new values are to be entered byte-wise and are entered left justified. This command is not available on CYBER 930.

NOTE

The CPU must be halted to execute this command.

Format

EK
AD=address
TC=type_code
B1...Bn

Parameters *AD*

The four-digit hexadecimal ADdress to begin displaying the control store memory. This parameter is required.

TC

The one-digit Type Code for the desired control store. The default is 0 or the most recently entered value from a DK, DS, EK, or ES command.

B1...Bn

The new values for the bytes starting at the byte address specified by the AD parameter. Each value is a one- or two-digit hexadecimal number. One or more bytes may be changed at a time.

Miscellaneous Commands

Return MDD PP to the Operating System

Purpose The BY command causes MDD to give up the communications port and return the PP to the operating system if no other SCI is made active (for example, SCD). MDD must then be started from the operating system console.

The BY command causes MDD to write into word DFCM+10 in the Environmental Interface Control Block (if at least at Level 4) the following status.

Bit	Meaning
0-15	RFU.
16-31	Number of SCI overlays that were actually loaded from CM.
32-47	Number of times MDD wrote CM.
48-63	Number of times MDD wrote Maintenance Registers.

NOTE

If MDD was initiated by CIP in a dual state environment, this command, enters the values described above, responds with `*ILL*` and MDD continues to function normally.

Format **BY**

Set Refresh Mode

Purpose MDD can be run in a refresh mode that allows the user to watch registers or memory change. In refresh mode, MDD outputs an 18 (hexadecimal) and a 0C (hexadecimal) to clear the screen for most CRT terminals. The terminal should be in page mode; when operating in this refresh mode, the cursor homes to lower left.

Format **SR**
mode

Parameters *mode/x*

ON sets MDD to display in refresh mode and OF sets the refresh mode off. The initial default value is off.

Set Refresh Rate

Purpose If MDD is operating in refresh mode, the RR command allows the user to set the refreshing rate faster or slower. This allows the user to adjust the refreshing rate to his/her needs by repeating this command.

Format **RR**
change

Parameters *change/x*

This parameter has two values. FA causes the displays to be updated more rapidly and SL slows down the refreshing rate. The initial default is FA.

Display MDDs Commands

Purpose The HE command allows the user to see a brief explanation of all of the commands which are available. If the command parameter is specified, MDD displays the syntax for that command. To accommodate different screen sizes, a pause is inserted into the output of the command list to allow the user time to read the information. Pressing any key at this time causes the list to continue.

Format **HE**
command

Parameters *command*

When this optional parameter is entered, MDD displays the syntax for the desired command. If an invalid command name is entered, MDD responds with `*ILL*` (see Other Messages to the Terminal).

ESC Key

Purpose The ESC key allows the user to terminate the input of a command. When MDD receives a 1B (hexadecimal), it terminates any input it has received, outputs the message `*ILL*`, and waits for new input.

Other Messages to the Terminal

Message	Cause of Message
CHANNEL 17 HUNG	MDD shares the maintenance channel with other utilities. If this channel is hung and MDD is unable to access it, the message CHANNEL 17 HUNG appears. When this happens, all commands which access this channel no longer function.
CLEARED	After MDD does a master clear (CX) of an element, the message CLEARED is displayed.
CPU Halted	MDD has halted the currently selected CPU.
CPU must be Halted to access Control Store	Execute a DS, DK, ES, or EK command the CPU must be halted.
CPU Started	MDD has started the currently selected CPU.
CPU x	MDD has set the default CPU to the value indicated by x.
CPU 0	Value for a nonexistent CPU. MDD has reset to the default CPU of 0.
CPU # not found	The SE command was given with a CP parameter.
Deadman Timeout	MDD has encounted an error while it was attempting to read or write a maintenance register.
DFT NOT VERIFIED	DFT has rejected the DFT block. The SD command will not function.
ERROR	MDD has encountered an error while it was attempting to read or write a maintenance register.
ERROR Handling inactive	MDD has set the desired flag in the DFT Control Word.
ERROR Handling active	MDD has cleared the desired flag in the DFT Control Word.
IGNORED	If the user wishes to abort a command, he/she may press the ESC key. MDD then ignores the previous input. Or the F7 key has been pressed and no other driver has signaled a request for the port.
ILL	If the user enters a command which MDD does not recognize or uses improper syntax, MDD responds with *ILL*. The previous input is ignored and the user should enter the proper command and syntax. MDD also follows this protocol if it detects a character it does not recognize (for example, @). If the user wants to abort a command he may press the ESC key. MDD responds *ILL* and ignores the previous input.

Message Center	Cause of Message
MDD Level xx Copyright CONTROL DATA 1985	Each time MDD acquires access to the terminal via the two port multiplexer this message is displayed. This permits the user to confirm that he/she is communicating with MDD. The xx after the word level is incremented for each update to MDD.
MEMORY WRITE WOULD CROSS OS BOUNDS	An attempt to execute an EB or EC command would cause MDD to violate the OS Bounds register. The user should enter the AB command and try again.
MR ERROR	MDD has encountered an error while trying to access channel 15.
NO DFT	The DFT PP has not verified (or rejected) the DFT control block. The DF and SD commands do not execute.
OS BOUNDS toggled for MDD	The next execution of an EB, EC, or SD command allows MDD to reset its side of the OS Bounds register if needed.
PAGE MISSING	MDD has searched the Page Table for an address specified by a DM command and has not found the page in central memory.
PP HALTED	Indicates MDD has halted a PP.
Press any key for more HELP	The listing of the commands available to MDD has been suspended. Any key pressed causes the output to continue.
PROCESSOR HALTED	MDD has halted the currently selected CPU.
Processor MUST be HALTED to read Control Store	To execute a DS or DK command the processor must be halted.
Processor MUST be HALTED to write control store	To execute a ES or EK command the processor must be halted.
PROCESSOR STARTED	MDD has started the currently selected CPU.
SEGMENT MISSING	The segment number provided on a DM command is either invalid or has an invalid ASID.
VSM/MDD Level xx	Each time MDD aquire access to the terminal via the TPM this message is displayed. This allows the user to confirm communications with MDD. The xx is incremented for each update of USM/MDD.
WRITE WOULD CROSS MEMORY BOUNDS	An attempt to execute an EB or EC command would cause MDD to violate the Memory Bounds register. The user must know how to enable write and try again.

Error Log/Dayfile Messages

Message	Cause of Message
MDD - ALREADY ACTIVE.	There is already a copy of MDD executing in a PP. A "BY" command must be issued to that copy before a new one can be initiated.
MDD - CONSOLE MUST BE UNLOCKED.	An attempt was made to bring MDD up when the operators console was in a locked state. The operator should unlock the console. MDD will drop out. An alert status is sent.
MDD - IMPROPER ACCESS ATTEMPT.	MDD was not initiated with the proper validation. MDD will drop out. On NOS an alert status is sent.
MDD - MR ERROR.	A maintenance register error was detected at itialization time. MDD will drop out. If no PPs are hung, the operator should attempt to bring MDD up again.
MDD - NOT ALLOWED ON THIS MAINFRAME.	MDD will only run in a CYBER 170-8xx mainframe (865-875 excluded), 180-8xx mainframe, or a 180-9xx mainframe. MDD will drop out. On NOS an alert status is sent.
MDD - SCI NOT FOUND IN CIP DIRECTORY.	MDD has searched the central memory CTI directory and has not found the resident version of SCI. The CIP level is less than 7. MDD will drop out. On NOS an alert status is sent.
MDD - VALIDATED.	MDD has successfully validated itself and begun operation.
MDD - MUST BE INITIATED FROM NOS/VE.	When NOS/VE is active in a dual state environment, MDD cannot be initiated from the 170 side. It must be brought up on the 180 side. MDD could be initiated from the 170 side before NOS/VE is deadstarted.

Examples of MDD Command Usage

```
dr i
0 0000000000000000 SS
12 0000FFFAFFFF0F07 OI
18 0000000000000000 MASK REGISTER
21 1F1F1F1F000007FE OS BOUNDS
30 0000000000000009 EC
40 0000000000008800 STATUS
80 0000000000000000 FS1
81 0000000000000000 FS2
A0 0000000000000003 TM
```

Display register with default IOU registers.

```
dr m
00 0000000000000000 SS
12 0041000000000000 OI
20 0100000002000000 EC
21 400000000bf60000 MEM BOUNDS
A0 0000000000000000 CEL
A4 0000000000000000 UEL1
A8 0000000000000000 UEL2
```

Display register with default memory registers.

```
er m 21 0
21 0000000000000000
```

Disable Memory Bounds.[1]

```
er m 21 400000000bf60000
21 400000000bf60000
```

Restore Memory Bounds.

```
dr p 61
61 0000000000FF8270
```

Display register 61 of the processor.

```
dm pva=500000000 mps wc=5
* SEGMENT *005
00000000  00 00 18 00 00 10 81 20
00000008  90 00 00 00 09 09 19 83
00000010  00 00 03 40 00 00 00 18
00000018  00 00 00 02 00 FF 89 D0      p
00000020  80 01 00 4A 0E 12 AC DF    J  ,
```

Display the first five words of EI.

```
db
000FFA000  00 00 18 00 00 10 81 20
000FFA008  90 00 00 00 09 09 19 83
000FFA010  00 00 03 40 00 00 00 18
000FFA018  00 00 00 02 00 FF 89 00      p
000FFA020  8D 01 00 4A 0E 12 AC DF    J  ,
```

Display the same memory with the DB command.

1. Not available on CYBER 930.

```
dh
01FF400  0000180000108120
01FF408  9000000009091983
01FF410  0000034000000018
01FF418  0000000200FF89D0      p
01FF420  8D01004A0E12ACDF   J  ,
```

Display the same memory with the DH command. Note: the display address is given by word address instead of byte address.

```
dc
007772000  0000600000000004100440     F   DHDI
007772001  0000000000001102214601         IBQ A
007772002  0000006400000000030              X
007772003  0000000100077704720     H        P
007772004  6401000450160452601 7   A D ND    O
```

Display the same memory with the DC command.

```
dh,17EF65,4
017EF65  00000000000AD870    p
017EF66  0100100100000B28    (
017EF67  00FF100100000B28    (
017EF68  FE00FFFFB0000000
```

Display four words of memory in hexadecimal word format. Note: The display address is given by word address.

```
+
017EF69  00001E070000F7C0    w
017EF6A  0000100000010200
017EF6B  0000100000000180
017EF6C  0000100000000000
```

Advance to the next block of memory.

```
db wc=1 ad=bf7b29
0BF7B28  00 00 10 00 00 0A 08 70  p
```

Display one word in byte format. Note: Address was rounded down.

```
+30
0BF7B58  00 00 10 00 00 00 01 80
```

Advance the display by 30 (hexadecimal) bytes.

```
-B58
0BF7000  90 00 00 13 00 10 41 07
```

Display memory b58 bytes lower in memory.

```
eb bf7003 1 2 3b 4
```

Change memory byte-wise.

```
db
0BF7000  90 00 00 01 02 3B 04 07
```

Display memory just changed.

```
mc
MCR = CLEAR
```

Display current MCR register flags.

```
mc 8010
MCR = DUE, SIT,
```

Display bit definitions for MCR.

```
uc 9000
UCR = PRIV FAULT, PIT
```

Display bit definitions for UCR.

```
dp a
A REG
004000 000073 000127 000145 000153
000154 000001 000147 006421 005510
000022 000001 000002 000056 004276
001460 173542 004563 777771 003551
```

Display PP A registers.

```
he rr
RR [FA/SL]
he
DB  DISPLAY MEMORY C180-BYTE
DC  DISPLAY MEMORY C170-WORD
DH  DISPLAY MEMORY C180-WORD
DM  DISPLAY VIRTUAL MEMORY
EB  ENTER HEX BYTE[S]
EC  ENTER A C170 WORD
DR  DISPLAY REGISTER CONTENTS
ER  ENTER REGISTER CONTENTS
RF  DISPLAY REGISTER FILE
DK  DISPLAY CONTROL STORE
DS  DISPLAY CONTROL STORE
EK  ENTER CONTROL STORE
ES  ENTER CONTROL STORE
CE  CLEAR ERROR ON PORT
CX  MASTER CLEAR PORT
HP  HALT PROCESSOR
SE  SET CPU VALUE
SP  START CONTROL STORE
MC  EXPLAIN MCR BITS
UC  EXPLAIN UCR BITS
DP  DISPLAY PP REGISTER
IP  IDLE PP
Press any key to continue.
q
RP  RESTART PP AT A SPECIFIED ADDRESS
DF  DISPLAY DFT HEADER
MB  DISPLAY DFT MAINTENANCE REGISTER BUFFER
MD  DISPLAY DFT MODEL DEPENDENT BUFFER
SD  SET DFT STATE FOR ERROR ACTIONS
RR  SET REFRESH RATE
SR  SET REFRESH
BY  RETURN MDD PP
```

Display the syntax for the RR command.

Display a list of commands.

(Any key entered from terminal.)

Display the DFT Control Block Header (version 3)

```
df

0701030119030080  OFT Control Word
0022000000020008  SECDED ID Table PTR.
002A0000000201A9  Maintenance Reg. Buffers PTR.
0000000000000000  Model Dependent Buffer PTR.
003300030E800004  NOS/VE Buffer PTR.
0000000000000000  C170 PP Resident Buffer PTR.
0000000000000000  C170 OS Request PTR.
DFT = DFT VERIFIED,
```

Display the DFT Control Block Header (version 4)

```
df

0D0704010F110080  DFT control word
0010000000020000A  SECDED ID table PTR.
001C0000000200FF  Maintenance Reg. Buffer PTR.
0000000000000000  Model Dependent Buffer PTR.
003300030E900004  NOS/VE Buffer PTR.
0000000000000000  C170 PP Resident Buffer PTR.
0000000000000000  C170 OS Buffer PTR.
001D000000060011  MR Buf. Control Words Buffer PTR.
0030000000060004  MF Element Counter Buffer PTR.
0036000000060019  DFT Control Info. Buffer PTR.
0011000000070078  Supportive Status Buffers PTR.
000B000000090015  Non-Register Status Buffer PTR.
0022000000090064  DFT Central Memory Resident PTR.
DFT = DFT VERIFIED,
```

Display DFT Maintenance Buffer

```
mb
0000000000000000  Maint. Reg. Buff. Control Word
00000D00D0D00019  Maint. Reg. Buff. Control Word
0000000000000032  Maint. Reg. Buff. Control Word

mb 1
TOP OF HOUR MAINFRAME ELEMENT COUNTERS
ELEMENT      ULOG CORR UCOR
CPU-0      - 0000 0000 0000
CPU-1      - 0000 0000 0000
IOU-0      - 0000 0000 0000
MEMORY-0   - 0000 0000 0000
```

```
sd t on
Error Handling INACTIVE

sd t of
Error Handling ACTIVE
se 1
CPU 1.

se 3
CPU # not found
CPU 0.


by                                    This response comes from the CIP
*ILL*                                 version.

hp
CPU HALTED

sp
CPU STARTED


EB 345F8 44 33 4?*ILL*                Illegal character entered by
                                      mistake.
```

Registers Displayed by MDD

For the IOU, the following are displayed and labeled accordingly.

```
00 xxxxxxxxxxxxxxxx SS
12 xxxxxxxxxxxxxxxx OI
18 xxxxxxxxxxxxxxxx MASK REG
21 xxxxxxxxxxxxxxxx OS BOUNDS
30 xxxxxxxxxxxxxxxx EC
40 xxxxxxxxxxxxxxxx STATUS
80 xxxxxxxxxxxxxxxx FS1
81 xxxxxxxxxxxxxxxx FS2
A0 xxxxxxxxxxxxxxxx TM
```

For an IOU - 4 the following CIO registers are also displayed.

```
16 xxxxxxxxxxxxxxxx OI
1C xxxxxxxxxxxxxxxx MASK REG
25 xxxxxxxxxxxxxxxx OS BOUNDS
34 xxxxxxxxxxxxxxxx EC
44 xxxxxxxxxxxxxxxx STATUS
84 xxxxxxxxxxxxxxxx FS1
85 xxxxxxxxxxxxxxxx FS2
A4 xxxxxxxxxxxxxxxx TM
B0 xxxxxxxxxxxxxxxx C-CH 0
B1 xxxxxxxxxxxxxxxx C-CH 1
B2 xxxxxxxxxxxxxxxx C-CH 2
B3 xxxxxxxxxxxxxxxx C-CH 3
B4 xxxxxxxxxxxxxxxx C-CH 4
B5 xxxxxxxxxxxxxxxx C-CH 5
B6 xxxxxxxxxxxxxxxx C-CH 6
B7 xxxxxxxxxxxxxxxx C-CH 7
B8 xxxxxxxxxxxxxxxx C-CH 8
B9 xxxxxxxxxxxxxxxx C-CH 9
```

For memory, the defaults are:

```
00 xxxxxxxxxxxxxxxx SS
12 xxxxxxxxxxxxxxxx OI
20 xxxxxxxxxxxxxxxx EC
21 xxxxxxxxxxxxxxxx MEM BOUNDS
A0 xxxxxxxxxxxxxxxx CEL
A4 xxxxxxxxxxxxxxxx UEL1
A8 xxxxxxxxxxxxxxxx UEL2
```

For a 990 CPU, the following memory registers are also displayed or are relabeled.

```
A0 xxxxxxxxxxxxxxxx CEL0
A1 xxxxxxxxxxxxxxxx CEL1
A2 xxxxxxxxxxxxxxxx CEL2
A3 xxxxxxxxxxxxxxxx CEL3
A4 xxxxxxxxxxxxxxxx UEL1
A5 xxxxxxxxxxxxxxxx UEL2
A6 xxxxxxxxxxxxxxxx UEL3
A7 xxxxxxxxxxxxxxxx UEL4
```

For the CPU, the following list is displayed for all mainframes.

00 xxxxxxxxxxxxxxxx SS
30 xxxxxxxxxxxxxxxx DEC
31 xxxxxxxxxxxxxxxx S
40 xxxxxxxxxxxxxxxx P
41 xxxxxxxxxxxxxxxx MPS
42 xxxxxxxxxxxxxxxx MCR
43 xxxxxxxxxxxxxxxx UCR
48 xxxxxxxxxxxxxxxx PTA
49 xxxxxxxxxxxxxxxx PTL
4A xxxxxxxxxxxxxxxx PSM
51 xxxxxxxxxxxxxxxx MDW
61 xxxxxxxxxxxxxxxx JPS
62 xxxxxxxxxxxxxxxx SIT
80 xxxxxxxxxxxxxxxx PFS

In addition, the following registers are displayed for a series.

810, 830 CPU - 815, 825 CPU

81 xxxxxxxxxxxxxxxx PFS1 - 93 xxxxxxxxxxxxxxxx MCEL
91 xxxxxxxxxxxxxxxx CSEL
93 xxxxxxxxxxxxxxxx MCEL

835 CPU

81 xxxxxxxxxxxxxxxx PFS1
92 xxxxxxxxxxxxxxxx CCEL
93 xxxxxxxxxxxxxxxx MCEL

845, 855 CPU

81 xxxxxxxxxxxxxxxx PFS
82 xxxxxxxxxxxxxxxx PFS
83 xxxxxxxxxxxxxxxx PFS
84 xxxxxxxxxxxxxxxx PFS
85 xxxxxxxxxxxxxxxx PFS
86 xxxxxxxxxxxxxxxx PFS
87 xxxxxxxxxxxxxxxx PFS
88 xxxxxxxxxxxxxxxx PFS
89 xxxxxxxxxxxxxxxx PFS

990 CPU

81 xxxxxxxxxxxxxxxx PFS
82 xxxxxxxxxxxxxxxx PFS
83 xxxxxxxxxxxxxxxx PFS
84 xxxxxxxxxxxxxxxx PFS
85 xxxxxxxxxxxxxxxx PFS
86 xxxxxxxxxxxxxxxx PFS
87 xxxxxxxxxxxxxxxx PFS
88 xxxxxxxxxxxxxxxx PFS
89 xxxxxxxxxxxxxxxx PFS
8A xxxxxxxxxxxxxxxx PFS
8B xxxxxxxxxxxxxxxx PFS
8C xxxxxxxxxxxxxxxx PFS
8D xxxxxxxxxxxxxxxx PFS
8E xxxxxxxxxxxxxxxx PFS
8F xxxxxxxxxxxxxxxx PFS

CIP Error Messages B

This appendix contains an alphabetical listing of the error messages that may appear during a CIP operation. All messages are sorted according to the first nonvariable word or character. Messages beginning with special characters (such as hyphens or asterisks) are sorted as if the special characters were not present.

Messages issued by MSL are not included here. See the appropriate MSL reference manual.

Message	Description	Reporting Module
ALL CPUS OFF, OS LOAD IMPOSSIBLE	At least one CPU must be turned on for the OS load to proceed.	CTI
CEJ/MEJ OPTION NOT ENABLED FOR CEJ/MEJ USAGE, ENABLE SWITCH ON DEADSTART PANEL AND DEADSTART (CR) FOR NON CEJ/MEJ USAGE	Indicates the CEJ/MEJ switch is physically set to the disable position on the deadstart panel and is not logically disabled via the Hardware Reconfiguration display. Enable the switch on deadstart panel and redeadstart to continue.	MAD
CENTRAL PROCESSOR(S) NOT ACCESSIBLE VIA MAINTENANCE CHANNEL. DEADSTART AND SELECT OPTIONS U,I,U,E TO OBTAIN EXPRESS DEADSTART DUMP. NOTE: THIS PROCEDURE WILL RESULT IN THE PARTIAL LOSS OF MAINTENANCE REGISTER INFORMATION. IF UNABLE TO COMPLETE THE DUMP OPERATION AFTER PERFORMING THIS PROCEDURE CONTACT A CUSTOMER ENGINEER.	Express Deadstart Dump determined during its initialization that the central processor is not accessible via the maintenance channel and this inaccessibility would cause a bad dump to be performed. Redeadstart and reselect EDD as directed. Since this procedure clears some of the error bits in the maintenance registers, some maintenance register information will be lost. If you are unable to complete the dump, inform CE.	EDD
CHANNEL ACTIVE ERROR	Channel active when it is supposed to be inactive.	EBL
CHANNEL 15 DATA TRANSFER ERROR	Data transfer error (dual I4). Inform CE.	PAK
CHANNEL nn PARITY ERROR	Status/Control (S/C) register error. Inform CE.	DHE
CHANNEL yy UNIT xx NOT RESPONDING	Tape unit xx on channel yy is not responding to a read request. The unit either is not ready or does not exist.	EBL

Message	Description	Reporting Module
CIP COMPONENT xxxx NOT FOUND	CTI cannot find CIP component xxxx in the common disk area. Reinstall CIP. If message persists, inform CE.	LMC, APP, EEE, PAK
CM ADDRESS PARITY ERROR	S/C register error. Inform CE.	DHE
CM MISMATCH - CM SIZE AS SET BY CTI DOES NOT MATCH THAT OF DUMP TAPE - DEADSTART REQUIRED	The EDD dump tape used for the Restore CM operation was dumped with a different size of memory. The CM size must be the same to reload central memory. Change CM size via CTI to the same as when the EDD dump was taken.	RCM
CM NOT ACTIVE - LEVEL 3 REC	Memory initialization cannot be performed on a level 3 recovery.	MIP
CM RELOAD NOT FOUND ON DUMP TAPE	The EDD dump tape used for the Restore CM operation does not have a central memory record. Use a correct EDD dump tape for restoring central memory.	RCM
CM UNAVAILABLE, (CR) TO RE-ENTER	Indicates that an address entered during a CM memory dump option is greater than the central memory size. Press the carriage return key and reenter the address.	HDP
CMC x PARITY ERROR	S/C register error. Inform CE.	DHE
CMC PARITY ERROR	S/C register error. Inform CE.	DHE
xxxxxxx COMMAND TOO LONG	Indicates that during a tape-to-disk copy, TDX has encountered a command to be placed on disk that has more than 60 (decimal) characters. The xxxxxxx in the message is the name of the program or command buffer where the faulty command was found. Pressing the space bar allows TDX to truncate the command to 60 (decimal) characters and continue the operation.	TDX
COMMON DISK AREA FULL	Insufficient space in the common disk area to perform an update build. Redeadstart using the CIP tape and initialize the CDA by selecting the Z option on the CAU Initial Options display.	CAU

Message	Description	Reporting Module
CON,CSaaaa,DSbbbb FCN,CSaaaa,DSbbbb WRT,CSaaaa,DSbbbb	When attempting to generate a dump tape, a connect reject (CON), function reject (FCN), or write error (WRT) was encountered. aaaa specifies the channel converter status. bbbb specifies the controller status.	EDD
COPY ERROR xxxxxxx	Indicates that during a copy operation, the program or command buffer xxxxxxx could not be copied successfully. Pressing the space bar allows TDX to skip to the next program or command buffer and resume copying.	TDX
CPU x NOT RESPONDING	CPU x did not respond to EI function request within 1-second time limit. Inform CE.	EEE, LMC, MIP, EBL
CPU x P REGISTER PARITY ERROR	S/C register error. Inform CE.	DHE
CS=nnnn	Device communication error (data channel converter status). Inform CE.	I/O Driver
CSU x ADDRESS PARITY ERROR	S/C register error. Inform CE.	DHE
CSU x FAULT	S/C register error. Inform CE.	DHE
CTI CYLINDER OVERFLOW	Space available on the CTI cylinder was not enough to contain the entire CTI file. This problem may have been caused by disk errors. Reformatting the disk or changing packs may resolve the problem.	ICD
CTI PPxx NOT RESPONDING DEADSTART ABORTED	CTI cannot communicate with the PP selected as the alternate PP. Inform CE.	APP, MDU, OME, LMO, EBL
xxxxxxx DCC ERR STAT yyyy	Indicates that the status received from the data channel converter for a tape drive (60X or 65X) shows that an error condition exists. The xxxxxxx in this message is the name of the program or command buffer that TDX was working with when the error occurred, and yyyy is the octal status word. Pressing the space bar allows TDX to request the current status word.	TDX

Message	Description	Reporting Module
DEADSTART ABORTED - FATAL ERROR	The system detected a fatal error during confidence testing. Inform CE.	DHE
DEADSTART SECTOR ERROR	Indicates TDX was unable to read or write the deadstart sector. A deadstart is required.	TDX
DISK BUSY	Indicates that the disk general status has responded busy to 10000 (octal) attempts by TDX to perform a seek to read or write. Pressing the space bar allows TDX to continue the read or write attempt.	TDX
DISK CONTROLLER RESERVED	Indicates that the disk controller general status shows the multiple access disk controller continues to be reserved to another PP channel following 20 (decimal) attempts 20 (decimal) attempts to connect to the unit. TDX continues to display the message and attempts the connect until successful or until a deadstart is performed.	TDX, ICD
DISK CONTROLLER TRANSFER ERROR xxxxxxx	Indicates TDX was unable to output or input the expected number of words to or from the disk controller, but that the general status indicates no errors. The xxxxxxx is the name of the program or command buffer being copied. Pressing the space bar causes TDX to retry the transfer.	TDX
DISK ERR STAT yyyy xxxxxxx	Indicates that the status received from the disk drive shows that an error condition exists. The xxxxxxx in the message is the name of the program or command buffer that TDX was working with when the error occurred, and yyyy is the octal status word. Pressing the space bar allows TDX to continue the operation, through the result may not be reliable.	TDX

Message	Description	Reporting Module
DISK FUNC REJ yyyy xxxxxxx	Indicates that a function sent to the disk controller has been rejected. The xxxxxxx in this message is the name of the program or command buffer that TDX was working with when the error occurred, and the yyyy is the octal value of the function code that was rejected. Pressing the space bar allows TDX to retry the operation.	TDX
DISK FUNCTION REJECT FUNCTION = xx	The indicated function code xx was not accepted by the disk controller. xx is the function code that was rejected. Press the carriage return key to attempt an error recovery operation.	TDX
DISK UNIT RESERVED	The general status indicates the disk unit has reserved status.	ICD, CAU
DISK READ ERROR INFORM CE	CTI was unable to access disk within a predetermined number of attempts. Inform CE.	EBL
DISK STATUS ERROR STATUS = xxxx	The general status word xxxx received from the disk indicates an error condition exists. Press the carriage return key to retry the operation.	CAU, LMC, EEE
DISK UNIT RESERVED	Indicates that the disk general status shows that the disk remains reserved to another controller following 20 (decimal) attempts to connect to the disk. TDX continues to display the message and attempts the connect until successful or until a deadstart is performed.	TDX
DISPLAY SPACE UNAVAILABLE FOR ADDITIONAL ERRORS	S/C or maintenance register error. Inform CE.	DHE
DUMP TAPE ON CHcc EQee UNuu NOT READY (CR WHEN READY)	The dump tape equipment for an express deadstart dump is not ready. Ready the equipment and press the carriage return key to continue.	EDD
DUMP TAPE ON CHcc EQee UNuu NO WRITE RING (CR WHEN READY)	The dump tape for an express deadstart dump does not contain a write ring. Insert a write ring and press the carriage return key to continue.	EDD

Message	Description	Reporting Module
ECS ERROR.	S/C register error. Inform CE.	DHE
ELEMENT NOT ACCESSIBLE VIA THE MAINTENANCE CHANNEL	Indicates that HDP is unable to access central memory, CPU, register files, or maintenance registers as required by the option.	HDP
ERROR - ADDRESS OUT OF RANGE	The system was unable to access the specified available memory during memory initialization. Press the carriage return key to clear the display.	ZAP
ERROR CM	The system detected an error in CM during hardware verification (HIVS). Inform CE.	HIVS
ERROR CPU xx	The system detected an error in CPU xx during hardware verification (HIVS). Inform CE.	HIVS
ERROR EM	The system detected an error in EM during hardware verification (HIVS) Inform CE.	HIVS
ERROR IN (error) FATAL TO DUMP OPERATION	An error occurred during an express deadstart dump operation. Press DEADSTART to retry the dump. If message reappears, inform CE.	EDD
ERROR IN EXECUTABLE AREA	A central memory parity error occurred prior to executing a test program in the CPU.	MIP
ERROR IN SECOND PPS	S/C register error. Inform CE.	DHE
ERROR PP xx	The system detected an error in PP xx during hardware verification (HIVS). Inform CE.	DHE
ERROR PPU xx	The system detected an error in PPU xx during hardware verification (HIVS). Inform CE.	HIVS
ERROR REG	The system detected an error during hardware verification (HIVS). Inform CE.	HIVS
ERRORS OCCURRED DURING CENTRAL MEMORY INITIALI-ZATION.	An error occurred during central memory initialization. Inform CE.	EEE

Message	Description	Reporting Module
FLAW CYL xxxx TRK yyyy SEC zzzz	Indicates that TDX has failed in four consecutive attempts to write data to a disk sector. The values in the message are the cylinder (xxxx), track (yyyy), and the sector (zzzz), which may not be written in. Pressing the space bar allows TDX to continue the copy with another sector. The bit of the flawed sector remains set in the SRT to ensure that TDX does not attempt to use the bad sector again.	TDX
FORMATTING ERROR	Indicates an error occurred while formatting the MSL area on an 895 Disk subsystem.	TDX
FUNCTION TIMEOUT, (CR) TO RETRY	Indicates that a function issued to the printer has not been accepted. Press the carriage return key to retransmit the function.	HDP
GS=nnnn	Device communication error (general status). Inform CE.	I/O Driver
HARDWARE VERIFICATION IS UNAVAILABLE WITH A LEVEL 3 DEADSTART (BS) PREVIOUS DISPLAY	HIVS can only be executed on a level 2 or less recovery.	OIP
ILLEGAL BUILD SELECTION OS FILES COULD BE DESTROYED	Indicates the build option selected could cause operating system files to be destroyed because space previously allocated to the operating system is being used. Choose an installation mode that will not destroy operating system files or deadstart and release the disk space using CTI.	TDX
ILLEGAL ENTRY	The user entered an illegal parameter during parameter entry. Press the space bar to return to the parameter display and reenter the parameter.	TDX
IMPOSSIBLE TO INSTALL PROGRAMS AND SAVE COMMAND BUFFER AREA	The operator is saving a command buffer library at cylinder xxxxxxx. TDX does not examine the two succeeding cylinders to find a suitable starting cylinder. Deadstart is required.	TDX

Message	Description	Reporting Module
INCORRECT LABEL FOR CM RELOAD MOUNT EDD TAPE (CR WHEN READY)	The tape used for the Restore CM operation is not a correctly labeled EDD dump tape. Mount the proper tape and press carriage return.	RCM
INSTALL ABORTED DUE TO DEVICE ERROR INFORM CE (CR) TO PROCESS DIFFERENT DEVICE	Error encountered during installation. Press the carriage return key to select a device or deadstart to exit.	ICD
INSTALLATION COMPLETE DEADSTART IS REQUIRED	Indicates TDX has completed a disk build for automatic CIP tape installation. Deadstart to continue.	TDX
INSUFFICIENT LOGICALLY ON PPS, DEADSTART ABORTED	Too many PPs have been logically turned off to permit a successful deadstart.	EEE, EBL
INTER-PP DATA TRANSFER ERROR	Indicates the tape or disk driver is unable to output or input the expected number of words to or from the other driver. The xxxxxxx is the name of the current program or command buffer. A deadstart is required.	TDX
INTERLOCK REG. CHANNEL FULL	For CYBER 70 only. Interlock register was detected as being full and should have been empty. Inform CE.	MIP
INVALID CHANNEL ENTRY	An invalid channel number was entered. Press the carriage return key and reenter the channel number.	ZAP
INVALID ENTRY	Invalid keyin. Pressing the left blank key clears the message.	A11
INVALID ENTRY	Indicates that a character that is not a member of an accepted character set as been entered. Enter a valid character to clear the error.	HDP
INVALID OPTION	Invalid option was selected.	All
INVALID PROGRAM NUMBER	Undefined CTI module requested.	DHE
INVALID SELECTION, (CR) TO RETRY	Indicates that the start address is larger than the end address for a CM memory dump option. Press the carriage return key and reenter the two addresses.	HDP

Message	Description	Reporting Module
IOU1 NOT RESPONDING	CTI cannot communicate with IOU 1. Inform CE.	PAK
IPL NOT FOUND	First record was read from the deadstart device and its name was not IPL.	ICD
LEVEL 3 RECOVERY NOT POSSIBLE. CENTRAL MEMORY INITIALIZATION HAS BEEN SELECTED BY THE OPERATOR, OR AUTOMATICALLY SET BY THE HARDWARE. DEADSTART AND SELECT DIFFERENT RECOVERY LEVEL, OR DO NOT SELECT MAINFRAME INITIALIZATION.	A level 3 recovery is not possible when power on initialization is selected. On I4 IOUs, power on initialization will be set automatically by CTI following a system power up, or when the current deadstart immediately follows an MSL load. In this case, you must change the deadstart level to less than 3.	IOQ
LOAD ERROR DEADSTART ABORTED	An attempt to load a module from the MSL or the CTI/MSL disk area failed. Inform CE.	CTI
LOGGING MAINTENANCE REGISTERS	Maintenance register errors and DHE is writing them to the CEL.	DHE
MAINS POWER FAILURE	S/C register error. Inform CE.	DHE
MAINTENANCE CHANNEL TIMEOUT (DEADSTART ABORTED) INFORM CE	Maintenance channel did not respond when an attempt was made to function or transfer data to a mainframe element. Inform CE.	EEE, MIP, LMC
MAINT. REG ERROR yyyy	The system detected an error in a maintenance register during hardware verification (HIVS). Inform CE.	HVS
MEMORY MARGINS SELECTED (CR) TO CONTINUE	CTI detected central memory margins status selected in the maintenance registers. Press the carriage return key to proceed, or return switch to normal and deadstart.	LMC
MAINTENANCE NOT FOUND ON DEVICE ENTER ALTERNATE DEVICE	The deadstart file does not contain the HVS module. Enter an alternate device or install the HVS module on the same device and redeadstart.	EBL

Message	Description	Reporting Module
MEMORY NOT ACCESSIBLE	A memory element is not accessible via the maintenance channel.	MAD
MEMORY UNAVAILABLE	Selected value exceeds memory. Clear message and reenter command. Operator has attempted to set the logical state of an I4 CIO RP, but none are installed.	OIP
MICROCODE INITIALIZATION ERROR (DEADSTART ABORTED) INFORM CE	Processor microcode failed to complete its initialization in the prescribed time limit. Inform CE.	LMC
MIN CONFIGURATION NOT AVAILABLE	The operator attempted to load microcode, EI, or both without the required minimum system elements. CTI also displays the count of each system element. Reconfigure hardware to at least the minimum configuration.	LMC
MODULE NOT ON LIBRARY DEADSTART ABORTED	An attempt to find a module on the MSL failed. Inform CE.	CTI
MONITOR CONDITION REGISTER=xxxx	During central memory initialization, a nonzero monitor condition register appeared in the job exchange package after reverting to monitor mode. Inform CE.	CTI
MORE S/C REGISTER ERRORS.	There were too many errors to fit on one screen.	MIP
MR-0-2 yyyy yyyy yyyy yyyy yyyy MR-0-1 yyyy yyyy yyyy yyyy yyyy yyyy MR-0-0 yyyy yyyy yyyy yyyy yyyy yyyy	The system detected a fatal error during confidence testing. Inform CE.	DHE
MS LOAD NOT POSSIBLE. ALTERNATE PP DISABLE IS SET, AND CENTRAL MEMORY INITIALIZATION HAS BEEN SELECTED BY THE OPERATOR, OR AUTOMATICALLY SET BY THE HARDWARE. DEADSTART AND CLEAR ALTERNATE PP DISABLE, OR DO NOT SELECT MAINFRAME INITIALIZATION.	Selection of the M option after selecting power-on initialization is only allowed when word 12 of the deadstart program directs CTI to initialize the alternate PP. Select the desired option and redeadstart.	IOQ

Message	Description	Reporting Module
MSL STARTING CYLINDER UNUSABLE	Indicates that the starting cylinder and the two succeeding cylinders are unsuitable for a maintenance-only installation. A deadstart is required to reattempt the installation at another cylinder.	TDX
MSL STARTING CYLINDER UNUSABLE ENTER -CR- TO USE ALTERNATE CYLINDER yyyy OR RELOAD TDX AND SELECT A NEW CYLINDER	Indicates that the starting cylinder is unusable, although one of the two succeeding cylinders is suitable for the operation. The yyyy is the cylinder which TDX has found to be suitable. Entering a CR allows TDX to prepare cylinder yyyy for the operation. Entering any other character allows TDX to request another starting cylinder.	TDX

NOTE

If the user is saving a command buffer library at cylinder xxxx, TDX displays the message IMPOSSIBLE TO INSTALL PROGRAMS AND SAVE COMMAND BUFFER AREA and does not examine the two succeeding cylinders.

xxxxxxx NAME TOO LONG	Indicates that TDX has detected a program or command buffer name on tape that contains more than seven characters. The xxxxxxx in the message is the first seven characters of the name that is too long. Entering a space bar allows TDX to skip to the next program or command buffer and continue the operation.	TDX
NM=xxx	CTI module xxx not found.	I/O Driver
NO CM AVAILABLE	An HIVS test is selected for which hardware is turned OFF via CTI or is physically not present.	I/O Driver
NO CP AVAILABLE	An HIVS test is selected for which hardware is turned OFF via CTI or is physically not present.	HIVS
NO PP AVAILABLE	An HIVS test is selected for which hardware is turned OFF via CTI or is physically not present.	HIVS

Message	Description	Reporting Module
xxxxxxx NO TAPE WRITE RING	Indicates that a disk-to-tape copy is being attempted and that no write ring is being detected on the tape. You may, upon seeing the NO TAPE WRITE RING message, unload and dismount the tape, insert a write ring into the tape hub, and mount and reload the tape. When you press the space bar, the tape is positioned at the beginning of tape and the copy proceeds. The xxxxxxx is the name of the program or command buffer with which TDX was working.	TDX
xxxxxxx NOT COPIED - END OF TAPE	Indicates TDX encountered the end-of-tape while writing program xxxxxxx in a disk to tape copy. TDX backspaced the tape and wrote end-of-information and file marks to the tape before displaying the message. A deadstart is required.	TDX
xxxxxxx NOT FOUND	Indicates that TDX has not been able to locate a program or command buffer for which it has been searching. The xxxxxxx in this message is the name being searched for. In the case of a tape-to-disk copy, the TDX search is initiated by a COPY FROM request. In the case of a disk-to-tape copy, the TDX search may be initiated by either a COPY FROM or COPY THRU request. For a COPY THRU request, TDX begins the search with the program entered for the COPY FROM message. Pressing the space bar returns TDX to the copy message that contains the unknown name.	TDX
OFFLINE MAINTENANCE NOT AVAILABLE	The M option was selected from the Initial Options display after deadstart from a HIVS/CIP tape.	EBL
OPERATING SYSTEM FILE NOT FOUND ON DEVICE. ENTER ALTERNATE DEVICE	The deadstart file does not contain the operating system. Enter an alternate device or install the operating system on the same device and redeadstart.	EBL

Message	Description	Reporting Module
PACKET TRANSFER ERROR TO IOU1 ERROR CODE - xx	Error Codes 1 = CHECKSUM ERROR 2 = ILLEGAL FUNCTION CODE 3 = PACKET TOO LONG 4 = DATA TRANSMISSION ERROR 7 = PP ERROR C = DATA ERROR 10 = CTRL-G EXCHANGE ABORTED 11 = NO START BYE 12 = PACKET ERROR 13 = TIMEOUT ERROR 14 = BUSY	PAK
PAGE TABLE AREA VERIFY ERROR, (DEADSTART ABORTED) INFORM CE	A data error was detected while doing a one/zeros page check of the central memory area in which the page table is built. Inform CE.	EEE
PARITY ERROR ON DATA RCVD FROM EXT CHANNEL.	S/C register error. Inform CE.	DHE
PARITY ERROR ON DATA XMTD FROM EXTERNAL PP.	S/C register error. Inform CE.	DHE
PNT FULL xxxxxxx	Indicates that the disk PNT is full. The xxxxxxx in the message is the name of the program or command buffer that filled the PNT. A deadstart is required to clear this message.	TDX
PP HUNG, (CR) TO RETRY	Indicates that communication has been lost with the PP performing the memory dump to printer. Press the carriage return key to attempt to reestablish communication.	HDP
PPnn NOT RESPONDING - FATAL ERROR - DEADSTART ABORTED	PP will not accept idle loop package or a processor (CP or PP) has not completed execution within a predefined time period. Inform CE.	MIP, LMC
PPnn STOPPED ON PARITY ERROR - PPM.	S/C register error. Inform CE.	DHE
PP UNAVAILABLE, (CR) TO RE-ENTER	Indicates that the PP chosen for the PP memory dump option physically does not exist. Press the carriage return key and reenter the desired PP number.	HDP
PPU ERROR.	S/C register error. Inform CE.	DHE

Message	Description	Reporting Module
PPU UNAVAILABLE, (CR) TO RE-ENTER	Indicates that the PPU chosen for the PPC memory dump option physically does not exist. Press the carriage return key and reenter the desired PPU number.	HDP
PRINTER BUSY	Indicates that the printer is busy. When the condition clears, the message is erased from the display and HDP execution continues automatically.	HDP
PRINTER NOT READY	Indicates that the printer is not ready to accept HDP output. When the condition clears, the message is erased from the display and HDP execution continues automatically.	HDP
PROCESSOR FAULT STATUS ERROR (DEADSTART ABORTED) INFORM CE	A fault status error was detected while the processor was being initialized. Inform CE.	EEE
PROCESSOR NOT ACCESSIBLE	A processor element is not accessible on the maintenance channel.	MAD
PROCESSOR NOT RESPONDING FATAL ERROR - (DEADSTART ABORTED) INFORM CE	A processor exists, but is not responding to functions on the maintenance channel. Inform CE.	MIP
PROGRAM NOT ON TAPE - mne	The program name was not found when reading the tape.	CAU
READ DISASSY PARITY ERROR.	S/C register error. Inform CE.	DHE
READ PYRAMID PARITY ERROR.	S/C register error. Inform CE.	DHE
S/C REGISTER CHANNEL FULL - FATAL ERROR.	Inform CE.	MIP
S/C REGISTER ERRORS.	This is a header for an SCR error display.	MIP, LMC
SCR ERROR yyyy	The system detected an error in a S/C register during hardware verification (HIVS). Inform CE.	HIVS
SECDED DOUBLE BIT ERROR - QUADRANT xx, CSU y	S/C register error. Inform CE.	DHE
SECDED SINGLE BIT ERROR - QUADRANT xx, CSU y	S/C register error. Inform CE.	DHE

Message	Description	Reporting Module
SHUTDOWN IMMINENT.	S/C register error. Inform CE.	DHE
SMU x ERROR.	S/C register error. Inform CE.	DHE
SR-0-2 yyyy yyyy yyyy yyyy yyyy. SR-0-1 yyyy yyyy yyyy yyyy yyyy yyyy. SR-0-0 yyyy yyyy yyyy yyyy yyyy yyyy. DEADSTART ABORTED - FATAL ERROR.	S/C register error. This message indicates that the system detected a fatal error during confidence testing. Inform CE.	DHE
SRT FULL xxxxxxxL	Indicates that the disk SRT has reserved the entire available area on the disk. The xxxxxxx in this message is the name of the program or command buffer that filled the disk. A deadstart is required to clear this message.	TDX
STATUS BIT ERROR	The system detected an error when the side door port was statused following a master clear during memory initialization. Press the DEADSTART switch to return to the Initial Options display. If the message reappears, inform CE.	ZAP
xxxxxxx TAPE ERR STAT yyyy	Indicates that the status received from the tape drive shows that an error condition exists. The xxxxxxx in this message is the name of the program or command buffer that TDX was working with when the error occurred, and yyyy is the octal status word. Pressing the space bar allows TDX to attempt to continue the operation, though the result may not be reliable.	TDX
xxxxxxx TAPE FUNC REJ yyyy	Indicates that a function sent to the tape drive or data channel converter (60X or 65X) has not been accepted. The xxxxxxx in this message is the name of the program or command buffer that TDX was working with when the error occurred, and the yyyy is the octal value of the function code that was rejected. TDX tries the operation three times (including timeouts) before displaying the message. Press the space bar to allow TDX to retry the operation.	TDX

Message	Description	Reporting Module
TAPE STATUS ERROR STATUS = xxxx	The general status word xxxx received from the tape indicates an error condition exists. Press the carriage return key to retry.	CAU
TPM FUNCTION TIMEOUT	The TPM function timed out.	PAK
xxxxxxx TAPE UNIT NOT READY	Indicates that the status received from the tape drive shows that the unit is not ready. The xxxxxxx is the name of the program or command buffer with which TDX was working. Correct the not ready condition without moving the tape and press the space bar to continue.	TDX
UNABLE TO ACCESS CPU VIA MAINTENANCE CHANNEL. ENTER (CR) TO CONTINUE, OR DEADSTART AND INFORM CE.	CTI was unable to access any CPU during initialization for printer dumps via HDP. Enter (CR) to perform PP or IOU register dumps only, or inform CE.	AEI
UNABLE TO ACCESS DISK (CR) TO PROCESS DIFFERENT DEVICE	Not able to access specified device. Press the carriage return key to select a different device or deadstart to exit.	SAD, ICD
UNABLE TO ACCESS PORT (CR) TO RETRY	The system was unable to access ESM during memory initialization using the specified channel and equipment. Press the carriage return key and reenter the channel and equipment numbers.	SAD,ZAP
UNABLE TO ACCESS TAPE (CR) TO PROCESS DIFFERENT DEVICE	Not able to access specified device. Press the carriage return key to select a different device or deadstart to exit.	SAD
UNABLE TO EXECUTE COMMON DISK AREA REQUEST. CDA HAS NOT BEEN INITIALIZED. DEADSTART REQUIRED.	With the release of CIP V006, an initial install is required before any CDA utility can be executed. Subsequent CIP releases do not require this initial build.	CAU
UNABLE TO EXECUTE COMMON DISK AREA REQUEST. CDA HAS NOT BEEN INITIALIZED. (CR) FOR OPTION DISPLAY	With the release of CIP V006, an initial install is required before any CDA utility can be executed. Subsequent CIP releases do not require this initial build.	CAU
UNABLE TO INSTALL CIP READ ONLY SWITCH ACTIVE	An attempt to install CTI to an FMD disk drive, CTI found the read-only switch depressed. Toggle the read-only switch.	ICD

Message	Description	Reporting Module
UNABLE TO LOAD MDD. THE INTEGRITY OF CENTRAL MEMORY HAS BEEN COMPROMISED.	MDD checksum failed.	CTI
UNABLE TO PERFORM -UPDATE- INSTALL. COMMON DISK AREA NOT INITIALIZED. DEADSTART AND SELECT AN -INITIAL- CIP INSTALLATION.	With the release of CIP V006, an initial install is required before any other build can be executed. Subsequent CIP releases do not require this initial build.	IOQ
UNAVAILABLE	Operator has attempted to set the logical state of an I4 CIO PP, but none are installed.	OIP
USER CONDITION REGISTER=xxxx	During central memory initialization, a nonzero user condition register appeared in the job exchange package after reverting to monitor mode. Inform CE.	CTI
UNUSABLE DISK	Indicates that the default starting cylinder for a HIVS installation is faulty. The operator must deadstart and perform the installation to a different device.	TDX
VERIFY CM DATA ERROR	Indicates CTI encountered errors when verifying EI data written to central memory. Inform CE.	EEE
WRITING MEMORY	Each available word of central memory is written with two patterns, checking for errors on each pass. The duration of the message is a function of central memory size.	CTI

Comments (continued from other side)

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eal edges with tape only.

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ARH219
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CIP Reference Manual

60457180 J

We value your comments on this manual. While writing it, we made some assumptions about who would use it and how it would be used. Your comments will help us improve this manual. Please take a few minutes to reply.

Who are you?

- ☐ Manager
- ☐ Systems analyst or programmer
- ☐ Applications programmer
- ☐ Operator
- ☐ Other _____

How do you use this manual?

- ☐ As an overview
- ☐ To learn the product or system
- ☐ For comprehensive reference
- ☐ For quick look-up

What programming languages do you use? _____

_____

How do you like this manual? Check those questions that apply.

Yes	Somewhat	No	
☐	☐	☐	Is the manual easy to read (print size, page layout, and so on)?
☐	☐	☐	Is it easy to understand?
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Comments? If applicable, note page and paragraph. Use other side if needed.

Would you like a reply? ☐ Yes ☐ No

From:

Name _____ Company _____

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Please send program listing and output if applicable to your comment.

TITLE: Control Data CYBER Initialization Package (CIP)

PUBLICATION NO.: 60457180
REVISION: J

CONTROL DATA CORPORATION
Technology and Publications Division
4201 North Lexington Avenue
St. Paul, Minnesota 55126-6198

REASON FOR CHANGE:

DATE: 04-05-88

Revision J of this manual incorporates changes at CIP level 700. Changes include addition of documentation for the CC596A console, inatallation of NOS/VE boot programs, and miscellaneous engineering changes.

INSTRUCTIONS:
Remove pages and insert attached new pages as follows:

Remove	Insert
Cover	Cover
Title Page through 11	Title Page through 11
1-1 through 1-4	1-1 through 1-4
Section 2 divider	Section 2 divider
2-1 through 2-67	2-1 through 2-73
3-11/3-12	3-11/3-12
3-29/3-30	3-29/3-30
4-11/4-12	4-11/4-12
4-27/4-28	4-27/4-28
Section 5 divider	Section 5 divider
5-1 through 5-49	5-1 through 5-49
6-3/6-4	6-3/6-4
6-29/6-30	6-29/6-30
6-37/6-38	6-37/6-38
Section 7 divider	Section 7 divider
7-1 through 7-31	7-1 through 7-33
B-1 through B-18	B-1 through B-18
Mailer/ Comment Sheet	Mailer/ Comment Sheet

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